ARIZONA DEPARTMENT
OF
ENVIRONMENTAL QUALITY

Douglas A. Ducey
Governor

Misael Cabrera
Director

October 24, 2017

Reading File: SWGP17-0351
USACE Permit: SPL-2003-00826-KAT
ADEQ LTF: 68471

Michael T. Reinbold
El Dorado Benson, LLC
8501 N. Scottsdale Road, Suite 120
Scottsdale, AZ 85253

Re: Modification of the CWA 401 Certification for the Villages at Vigneto, (previously Whetstone Ranch) impacting unnamed ephemeral washes in the San Pedro Watershed

Dear Mr. Reinbold:

The Arizona Department of Environmental Quality (ADEQ) received your letter for a CWA 401 Water Quality Certification (WQC) Modification on October 23, 2017. You submitted this document in accordance with Section 401(a) of the Clean Water Act (CWA) (33 U.S.C. §1251 et seq.) and the Arizona Revised Statutes Section 49-202. The letter requests a change of ownership to the State 401 WQC issued for Whetstone Ranch in July 2005.

ADEQ has re-reviewed documentation for this project and has determined the existing conditions in the certification will not violate applicable surface water quality standards in the San Pedro Watershed. The certification will continue to run concurrent with the US Army Corps of Engineers' CWA Section 404 permit. El Dorado Benson, LLC is responsible for complying with all the 401 certification conditions specified in the original State of Arizona's CWA 401 Water Quality Certification and U.S. Army Corps of Engineers Permit.

Thank you for your efforts to comply with Arizona's environmental requirements. Should you have any comments or questions regarding this matter, please do not hesitate to contact me at 602-771-4409 or by email at sherrill.laurie@azdeq.gov.

Sincerely,

Rosi Sherrill

Laurie (Rosi) Sherrill, Project Manager
Stormwater and General Permits Unit

electronic copies: U.S. Army Corps of Engineers, Regulatory Branch, Attn.: Kathleen Tucker
USEPA, Wetlands Regulatory Office
Westland Resources, Inc., Attn: Jim Tress and Diana Sandoval

HABITAT MITIGATION AND MONITORING PLAN ACOE FILE NO. 2003-00826-SDM PHASE I OF THE VILLAGES AT VIGNETO (FORMERLY WHETSTONE RANCH)

Prepared for:

EL DORADO BENSON, LLC
8501 N. Scottsdale Rd. Suite 120
Scottsdale, AZ 85253

Prepared by:

WestLand Resources, Inc.
Engineering and Environmental Consultants
4001 E. Paradise Falls Drive
Tucson, Arizona 85712
(520) 206-9585

November 2005
(Revised March 2018)

TABLE OF CONTENTS

1. DESCRIPTION OF THE PROJECT/IMPACT SITE 1
1.1. Project Location 1
1.2. Project Description/Overall Project Summary 1
1.3. Responsible Party 1
1.4. Jurisdictional Areas to be Filled by Habitat Type 2
1.5. Types, Functions, and Values of Jurisdictional Areas to be Directly or Indirectly Impacted 2
2. GOALS OF THE COMPENSATORY MITIGATION PROJECT 4
2.1. Type and Area of Habitat to be Established, Restored, Enhanced, and/or Preserved 4
2.2. Specific Functions and Values of Habitat Types to be Established, Restored, Enhanced, and/or Preserved 5
2.3. Time Lapse Between Jurisdictional Impacts and Expected Mitigation Success 6
2.4. Special Aquatic Habitats, Other Waters of the U.S. and Non-jurisdictional Areas Proposed as Compensatory Mitigation 6
2.5. Overall Watershed Improvements to be Gained 7
3. DESCRIPTION OF THE PROPOSED COMPENSATORY MITIGATION SITE 8
3.1. Process of Selecting Proposed Mitigation Site 8
3.2. Location and Size of Compensatory Mitigation Site 8
3.3. Long-Term Management/Stewardship of Mitigation Site 8
3.4. Existing Functions and Values of the Compensatory Mitigation Site 8
3.5. Jurisdictional Delineation 11
3.6. Present and Proposed Uses of the Compensatory Mitigation Site and All Adjacent Areas 11
3.6.1. Onsite Mitigation Parcels 11
3.6.2. Offsite Mitigation Parcel 11
3.7. Reference Site(s) 12
4. IMPLEMENTATION PLAN FOR THE MITIGATION LANDS 13
4.1. Rationale for Expecting Implementation Success 13
4.2. Responsible Party 14
4.3. Schedule 14
4.4. Site Preparation and Implementation 14
4.4.1. Site Fencing 14
4.4.2. Gully Repair 15
4.4.3. Artesian Well/Wetland Enhancement 15
4.4.4. Active Restoration of the Agricultural Fields 16
4.4.5. Active Enhancement of the River Floodplain 17
4.5. As-Built Conditions 17
5. MAINTENANCE ACTIVITIES DURING THE MONITORING PERIOD 18
5.1. Maintenance Activities 18
5.2. Responsible Party 18
5.3. Schedule 18
6. MONITORING PLAN AND PERFORMANCE STANDARDS FOR COMPENSATORY MITIGATION SITE 19
6.1. Target Functions and Values 19
6.2. Target Jurisdictional and Non-Jurisdictional Areas to be Established, Restored, Enhanced, and/or Preserved 20
6.3. Monitoring Methods 21
6.3.1. Operation and Management Monitoring 21
6.3.2. Ecological Functions & Values Monitoring for the Offsite Mitigation Parcel 21
6.3.3. Quantitative Performance Standards for Offsite Mitigation Area 23
6.3.4. Monitoring Schedule 25

6.3.5. Annual Monitoring Reports 25
7. COMPLETION OF COMPENSATORY MITIGATION 26
7.1. Notification of Completion 26
7.2. Agency Confirmation 26
8. CONTINGENCY MEASURES 27
8.1. Initiating Procedures 27
8.2. Alternative Locations for Contingency Compensatory Mitigation 27
8.3. Responsible Party 27
9. LITERATURE CITED 28

LIST OF TABLES

Table 1. Dominant Plant Species Observed at the Offsite Mitigation Parcel During Site Visits ... 10

LIST OF FIGURES

(follow text)

Figure 1. Vicinity Map
Figure 2. Aerial Overview of the Offsite Analysis Area
Figure 3. Offsite Mitigation Parcel OHWM Delineation
Figure 4. Implementation Plans Offsite Mitigation Parcel Planting and Fencing Plan

APPENDICES

Appendix A. Sample Restrictive Covenants
Appendix B. Implementation Plan

1. DESCRIPTION OF THE PROJECT/IMPACT SITE

1.1. PROJECT LOCATION

In 2006, the U.S. Army Corps of Engineers (Corps) issued an individual Clean Water Act (CWA) Section 404 permit (the Permit; Application Number 2003-00826-SDM) authorizing the discharge of dredged and/or fill material to 51 acres of waters of the U.S. within the City of Benson, Arizona in Cochise County (**Figure 1**). The Permit holder intends to discharge fill material into ephemeral drainages for pad fill and road and utility crossings (Permitted Activities) associated with a proposed 8,212-acre master-planned community (the Development Project) in accordance with the terms and conditions of the Permit.

The Development Project is located on private land south of U.S. Interstate 10 and east of AZ State Route 90 in Benson, Arizona within Township 17 South, Range 20 East, Sections 32-33, E ½ Section 31 and Township 18 South, Range 20 East, Sections 3-5, 8-10, 15-17, E ½ Sections 6, 7, and 18 (**Figure 1**).

1.2. PROJECT DESCRIPTION/OVERALL PROJECT SUMMARY

Shortly after the Permit was issued, national economic conditions deteriorated, affecting the regional real estate market, and delaying the Development Project. Ultimately, financial difficulties spurred the various owners of undeveloped land within the Whetstone Ranch boundaries (which includes the Development Project) to offer for sale more than 12,167 acres. El Dorado Benson, LLC (El Dorado) acquired this land in reliance in part on the existence of the Permit for the 8,212-acre Development Project. El Dorado purchased the Whetstone Ranch property in May 2014, and with the acquisition also accepted all terms and conditions of the Permit.

Planned activities within the Development Project include residential and commercial land uses, and associated storm water management facilities, roadways, utilities, and recreational amenities. The Final Community Master Plan (CMP) approved by the City of Benson did not modify the original 8,212-acre Preliminary CMP in any significant manner. It maintains a maximum of 20,000 dwelling units within the 8,212-acre Development Project and remains the same with regard to land use concepts, utility infrastructure requirements, overall traffic circulation patterns, preservation of open space, and total density for this portion of the larger property. Importantly, the first phase of the Vigneto Community Master Plan described in the Final CMP can be developed without modification of the Permit.

1.3. RESPONSIBLE PARTY

El Dorado Benson, LLC
8501 N Scottsdale Rd., Suite 120
Scottsdale, Arizona 85253

1.4. JURISDICTIONAL AREAS TO BE FILLED BY HABITAT TYPE

Approximately 475 acres of ephemeral drainages, or jurisdictional waters of the U.S., are located on lands within the Development Project. Within the Development Project 51 acres (11 percent) of the waters of the U.S. and associated xeroriparian habitat will be impacted from discharge of fill material for construction of roadway crossings, utility crossings, bank protection, and building pads. These unavoidable discharges and associated indirect impacts have been minimized to the maximum extent possible and are necessary to meet the Project's purpose and need.

The proposed impacts to waters of the U.S. will not impede or substantially alter flow patterns, and post-construction upstream and downstream conditions of waters of the U.S. should remain essentially unchanged. Therefore, the majority of waters of the U.S. within the Development Project, about 89 percent (424 acres of the ephemeral washes) will be unaffected by development activities and will remain in a natural state to provide cover, migration, and dispersal corridors for wildlife.

Proposed compensatory mitigation for impacts to waters of the U.S. from the Project consists of preservation in perpetuity of the avoided jurisdictional waters and associated xeroriparian habitat (a total of 1,624 acres of natural open space) within the Development Project (the Onsite Mitigation Parcels), and the acquisition, preservation, enhancement, and restoration of a nearby Offsite, 144-acre parcel (the Offsite Mitigation Parcel) that contains an intermittent reach of the San Pedro River. The Offsite Mitigation Parcel contains mesoriparian and hydroriparian habitat, a small special aquatic site associated with a leaking artesian well head, and two agricultural fields along an intermittent reach of the San Pedro River. The Onsite Mitigation Parcels and the Offsite Mitigation Parcel are collectively referred to as the "Mitigation Lands".

1.5. TYPES, FUNCTIONS, AND VALUES OF JURISDICTIONAL AREAS TO BE DIRECTLY OR INDIRECTLY IMPACTED

Waters of the U.S. to be impacted by the Project are ephemeral drainages (desert washes) that support flows during and immediately after significant storm events and therefore, have largely transient aquatic functions and values. Ephemeral waterways in this region primarily provide for flood flow and sediment conveyance, protection of surface water quality, groundwater recharge, erosion control, and waters of the United States and associated xeroriparian habitats provide wildlife habitat that provide forage and cover. Other functions attributed to perennial and intermittent waterways play a less important role in these ephemeral, lower productivity ecosystems (e.g., flood flow attenuation and retention; sediment and toxicant retention; and nutrient removal, retention, and transformation). Ephemeral washes also provide human values such as educational and recreational opportunities while maintaining the natural aesthetic and connection to the greater landscape. Although important, these values of ephemeral washes may be considered secondary to groundwater recharge and wildlife habitat functions.

Stormwater runoff volume within the waters of the U.S. on the Development Project will increase because of development in upland areas; however, detention retention basins will be incorporated into the Development Project and will control stormwater run-off so that flow velocity, depth of flow, and

potential for scour will not be adversely affected by this Project. Stormwater flows will not be obstructed following construction activities and development.

Stormwater velocity will be reduced and pollutants will be removed using onsite capture and infiltration of runoff in vegetated basins and depressed areas, and/or a combination of other appropriate drainage systems using Best Management Practices consistent with the goal of avoiding and minimizing impacts to waters of the U.S. The basins and/or depressed areas will retain stormwater discharge from residential and commercial portions of the Project at volumes less than or equal to a two-year storm event.

The groundwater recharge function of waters of the U.S. will largely be preserved or supplemented. About 89 percent of jurisdictional waters on the Development Project will remain undisturbed and post-development stormwater runoff will be regulated from the retention/detention basins described above.

Moisture conditions in excess of local precipitation promote higher vegetation biomass and vegetation structure in xeroriparian washes relative to surrounding uplands. Total vegetation volume (biomass) of Sonoran desertscrub has been measured at 0.46 m^3/m^2 at sites in southeastern Arizona (Mills et al. 1989). Vegetation volume in xeroriparian communities in Pima County ranges between 0.50 m^3/m^2 and 0.85 m^3/m^2 (SWCA 1993). Comparatively, vegetation volume in xeroriparian washes on the Development Project averages 0.54 ± 0.16 (SD) m^3/m^2 (WestLand 2005). These values of average xeroriparian vegetation biomass will remain unaffected by development of the Project.

Xeroriparian vegetation within the Development Project is comprised predominantly of two species: mesquite and catclaw acacia (81 to 100 percent of the vegetation volume). Mesquite comprises 62.6 ± 8.2 percent of the vegetation volume, followed by catclaw acacia at 30.0 ± 9.6 percent. Four other shrub species (burroweed, *Isocoma tenuisecta;* whitethorn acacia, *Acacia constricta*; snakeweed, *Gutierrezia sarothrae*; and desert honeysuckle, *Anisacanthus thurberi*) contribute 7.4 ± 7.9 percent of the vegetation volume; however, their frequency of occurrence is substantially lower than the two dominant species.

Wildlife habitat providing cover, foraging resources and dispersal opportunities will be maintained along ephemeral drainages through the Development Project during and after its development. The functions these ephemeral drainages provide, relative to surrounding uplands, will be preserved as part of Project development and management of open space areas.

2. GOALS OF THE COMPENSATORY MITIGATION PROJECT

2.1. TYPE AND AREA OF HABITAT TO BE ESTABLISHED, RESTORED, ENHANCED, AND/OR PRESERVED

The Permit holder, pursuant to the conditions of the 2006 permit, proposes to implement a compensatory mitigation program to offset unavoidable impacts to waters of the U.S. resulting from the Project. The type and area of habitat to be established, restored, enhanced, and/or preserved within the Mitigation Lands includes:

1. the avoided ephemeral washes (424 acres of waters of the U.S.) within the Development Project;
2. the associated xeroriparian and upland habitat (1,200 acres) within the primary and secondary buffer areas that comprise much of the Corps' scope of analysis area which will be set aside as natural open space; and
3. the Offsite Mitigation Parcel (approximately 144 acres, including about 115.3 acres of riparian woodland, 22 acres of fallowed agricultural land, an artesian well that leaks with associated 0.49-acre wetland,[1] and an estimated 6.7 acres of the channel of the intermittent San Pedro River).

Within the 25-foot wide buffer area along each side of all avoided washes (the Primary Buffer) human uses, including trails, will be restricted. In addition to the Primary Buffer there will be a Secondary Buffer of varying width and dimension that is located outside of and adjacent to the Primary Buffer and in larger blocks of open space in the eastern portions of the Development Project. Limited human access for multipurpose vehicle pathways will be allowed in the Secondary Buffer, however the Secondary Buffer will be primarily preserved in a natural condition in accordance with the restrictive covenants. (Three forms of restrictive covenant will be used – one allowing for trails and multipurpose vehicle access in the Secondary Buffer, second more restrictive form for the Primary Buffer and jurisdictional washes, and a third form for the Offsite Mitigation Parcel, which will allow for active restoration and revegetation of the site.)

The Offsite Mitigation Parcel includes the active San Pedro River channel, adjacent active floodplains, and abandoned floodplains (**Figure 2**). The abandoned floodplains include both undisturbed and disturbed (cleared for agricultural purposes) areas. The extant riparian habitats in the active floodplain (low terraces and sandbars near the river) are hydroriparian woodland and scrubland dominated by exotic saltcedar (*Tamarix ramosissima*) interspersed with isolated patches and individuals of mature Fremont cottonwood (*Populus fremontii*) and Goodding willow (*Salix gooddingii*). The abandoned floodplain (upper terrace several meters above the river) is occupied by mesoriparian mesquite woodland of intermediate age. Within the mesquite woodland on the abandoned floodplain is an artesian well and associated wetland complex. Agricultural lands within the mitigation site have been fallowed since the Permit was issued. These areas have become variously dominated by native mesquite which have volunteered since the fields were fallowed. While not quantitatively measured, the density of mesquite growing in these fields easily exceeds planting densities proposed in the prior version of this plan. Nevertheless, ample opportunity exists within the Offsite Mitigation Parcel for active restoration, habitat enhancement and active management and protection of the riparian and aquatic functions of the site.

[1] This wetland is supported by the abandoned artesian well head that leaks water. Absent this source of water, the wetland area within the mitigation site would no longer support wetland hydrology and the wetland soils and vegetation would cease to exist at the site over time. This area is not considered a jurisdictional water of the United States.

Appropriate restrictive covenants or conservation easements acceptable to the Corps will be recorded against the Mitigation Lands to protect in perpetuity their ecological values. **Appendix A** outlines a sample format for the restrictive covenants for Mitigation Lands. As noted above, two forms of restrictive covenant will be used on site – one allowing for trails in the Secondary Buffer and a second prohibiting trails in the Primary Buffer and jurisdictional washes. A third form will be used for the Offsite Mitigation Parcel, which will allow for active restoration and revegetation of the site.

2.2. SPECIFIC FUNCTIONS AND VALUES OF HABITAT TYPES TO BE ESTABLISHED, RESTORED, ENHANCED, AND/OR PRESERVED

The goal of the compensatory mitigation effort is to preserve the functions and values of the ephemeral washes and adjoining xeroriparian and upland buffer habitats in the Onsite Mitigation Parcels and the mesoriparian habitats found on the Offsite Mitigation Parcel where they have not been degraded by natural processes (e.g., erosion) or anthropogenic activities (e.g., agricultural clearing). Where such degradation has occurred on the Offsite Mitigation Parcel, the compensatory mitigation effort will include restoration or enhancement activities to return those areas to natural riparian habitat functions and values similar to those of undisturbed areas.

The ephemeral washes and adjoining xeroriparian and upland buffer areas within the Onsite Mitigation Parcels which comprises the bulk of the Corps' Scope of Analysis Area within the Development Project will continue to provide their existing ecological functions and values (described above) once they are preserved in perpetuity with the appropriate restrictive covenants. Maintenance of these ecological functions and values will be dependent on the active oversight and management of these areas within the larger development area by Permittee or their successor-in-interest, which will likely be the homeowner's association.

Within the Offsite Mitigation Parcel (**Figure 2**), the hydroriparian to mesoriparian woodlands of the active floodplains along the San Pedro River and active gullies within the mesoriparian mesquite woodland will be actively managed in an effort to enhance the density and productivity of native shrubs and trees within the Offsite Mitigation Parcel. Approximately 3,000 native trees and shrubs will be planted throughout these areas to supplement the existing native vegetation. The mesoriparian mesquite woodland will be preserved, while the adjoining agricultural field will be restored through revegetation to its former density and composition as mesquite woodland. The artesian well/wetland complex will be preserved and enhanced via removal of exotic saltcedar and planting of native vegetation. The agricultural lands will be restored to mesoriparian mesquite woodland, similar in composition and density to the adjoining mesquite woodland.

As the revegetated agricultural fields mature, they are likely to assume ecological functions similar to the adjoining mesquite woodland while increasing the patch size of this community within the Offsite Mitigation Parcel. The mesquite bosque was historically one of the most abundant riparian communities in the southwest, but is now reduced to remnant status (Stromberg 1993). Outside the Offsite Mitigation Parcel, abandoned agricultural fields in similar geomorphic settings commonly recolonize with mesquite naturally, demonstrating the potential for the recovery of this community following disturbance due to agricultural activities.

Arresting the migration of gully head cut erosion on the Offsite Mitigation Parcel will preclude further habitat degradation within the mesquite woodland and allow it to reach its full production potential and functional values. Curbing soil erosion generated from these gullies will also improve downstream water quality and reduce sediment deposition into waters of the U.S.

The preservation, maintenance, and enhancement of the artesian well/wetland complex will provide a perennial water source to wildlife in an area where surface water is limiting. Furthermore, it will ensure the endurance of a plant community that is poorly represented in the region, where most of the perennial wetlands were lost following channel incision and associated groundwater declines in the late 1800s.

Planting and preservation of native riparian trees and shrubs in the active floodplain along the San Pedro River channel will promote sediment deposition and the aggradation of floodplain terraces during overbank flow events. In the absence of catastrophic flooding and erosion, the aggradation of these floodplain terraces will facilitate the succession of these environments to mesquite woodland.

The existing functions and values of the habitat types on the Offsite Mitigation Parcel are detailed further along in the following section.

2.3. TIME LAPSE BETWEEN JURISDICTIONAL IMPACTS AND EXPECTED MITIGATION SUCCESS

Development of the Project will be incremental over a 20-year build-out period. Therefore, impacts to jurisdictional waters will also occur incrementally over this period. The protection of the avoided jurisdictional washes and the Primary and Secondary Buffers will occur over time in advance of development pursuant to the special conditions of the CWA Section 404 permit. The protection of the Offsite Mitigation Parcel will be immediate. Habitat enhancements resulting from erosion control measures (installation of grade stabilization structures) and protective fencing, saltcedar removal and planting of native species in the wetland area, active restoration of the agricultural fields, and planting of native species throughout the remainder of the Offsite Mitigation Parcel, including along the San Pedro River channel will provide immediate benefit to these habitats. These protection, enhancement, and habitat restoration measures will result in a negligible lapse in time between impacts to jurisdictional waters of the U.S. and successful mitigation. Maturation of the mesquite woodland habitats and other planted native species will continue to provide additional benefits during the 20-year build-out period for the Project.

2.4. SPECIAL AQUATIC HABITATS, OTHER WATERS OF THE U.S. AND NON-JURISDICTIONAL AREAS PROPOSED AS COMPENSATORY MITIGATION

Immediately south of the corral and fallowed agricultural field in the Offsite Mitigation Parcel (**Figure 2**), is a leaking artesian well and associated wetland (0.49 acres). The artesian well is a 6-inch diameter pipe, ball valve, and ¾-inch threaded outlet. Water drips at about ½ gallon per minute (gpm) from the pipe. Saltcedar and Goodding willow grow at the perimeter of the wetland. Alkali sacaton (*Sporobolus airoides*) grows down gradient of the well. Evidence of soils with high percentage organic matter and willows with canopy dieback suggest that the margin of the wetland may expand and contract depending on fluctuations in groundwater discharge from this system.

2.5. OVERALL WATERSHED IMPROVEMENTS TO BE GAINED

On the Offsite Mitigation Parcel, erosion control measures will be installed to control active the head cut preventing the advance of the gullies, enhancing environmental quality (e.g., reduced sediment discharge to waters of the U.S.), maintaining wildlife habitat and productivity of the mesquite woodlands. and protecting the artesian well/wetland complex from future degradation.

Preservation of the artesian well/wetland complex, the enhancement of native vegetation within this area, and the installation of erosion control structures downgradient as a preventive measure, will prevent the loss of rare emergent wetlands at the offsite mitigation parcel and enhance the wildlife value of this habitat.

Preservation of the intermediate age mesquite woodland will promote the development of mature woodland, or bosque, a severely depleted age class of this otherwise widespread community of alluvial floodplains in southeastern Arizona.

Supporting and facilitating the natural revegetation of the agricultural fields by removal of weeds and continued exclusion of farming activities with limited enhancements by plantings of native trees and shrubs will foster its restoration to mesquite woodland.

Planting and preservation of native riparian trees and shrubs in the active floodplain will promote sediment deposition and the aggradation of floodplain terraces during overbank flow events. In the absence of catastrophic flooding and erosion, the aggradation of these floodplain terraces will facilitate the succession of these environments to mesquite woodland.

The preservation of 424 acres of waters of the U.S. within the Project Area will maintain the majority of recharge potential within the Project Area.

3. DESCRIPTION OF THE PROPOSED COMPENSATORY MITIGATION SITE

3.1. PROCESS OF SELECTING PROPOSED MITIGATION SITE

Four hundred twenty-four acres of avoided jurisdictional waters of the U.S. within the Project area were automatically included as partial onsite mitigation for impacts to 51 acres of waters of the U.S. subjected to unavoidable discharges of fill. The Primary Buffer lands were selected because of their proximity to avoided jurisdictional washes. Secondary Buffer lands were selected to enhance the open space areas along the preserved jurisdictional washes outside the Primary Buffer lands and to provide additional large blocks of natural open space. To further meet compensatory mitigation requirements for the Project, offsite parcels of higher quality habitat and functional values than ephemeral washes were examined for purchase along the San Pedro River within the Upper Basin watershed. A parcel of 144 acres meeting these requirements was identified and purchased from a willing seller. In selecting the Offsite Mitigation Parcel, the original Applicant for the Permit actively sought high-value riparian habitat along the San Pedro River, which through active management, could be enhanced to further offset Project impacts. When the permittee acquired the Whetstone Ranch properties they also acquired the Offsite Mitigation Parcel. When acquiring the Whetstone Ranch Properties, El Dorado accepted all the terms and conditions that went along with the CWA Section 404 Permit, including the obligations to implement the HMMP made a condition of the Permit.

3.2. LOCATION AND SIZE OF COMPENSATORY MITIGATION SITE

Avoided jurisdictional waters comprising approximately 424 acres within the Development Project are located within the Township 17 South, Range 20 East Sections 31 through 33 and Township 18 South Range 20 East Sections 3 through 10 and 15 through 18, Gila and Salt River Base Meridian, City of Benson, Arizona. The Primary Buffer and Secondary Buffer lands are approximately 1,200 acres in size and are located within the Development Project. Combined, the preserved jurisdictional waters and Primary and Secondary Buffers, will total 1,624 acres. The Offsite Mitigation Parcel encompasses 144 acres along the San Pedro River, about 2 miles northeast of the northeastern corner of the Development Project, within Township 17 South, Range 20 East in the Southeast ¼ of Section 23, Gila and Salt River Base Meridian.

3.3. LONG-TERM MANAGEMENT/STEWARDSHIP OF MITIGATION SITE

El Dorado will provide for the protection and management of the Mitigation Lands within the Development Project and Offsite Mitigation Parcel by making such lands subject to the restrictive covenants in the form attached hereto as **Appendix A** or as otherwise approved by the Corps of Engineers and El Dorado. Management of the avoided jurisdictional washes, Primary Buffer, and Secondary Buffer will eventually be transferred to the homeowner's association.

3.4. EXISTING FUNCTIONS AND VALUES OF THE COMPENSATORY MITIGATION SITE

The offsite mitigation area is located on private land along the west bank (river left bank) of the San Pedro River between the towns of Benson and St. David, Arizona in Township 17 South, Range 20 East, and portions of Sections 23 and 24. Elevations within the offsite mitigation area range from 3,535 to

3,560 feet above mean sea level. Elevational changes are most evident near the San Pedro River where the channel is incised and the adjacent terrace can be over 20 feet above the active channel. This channelization occurs along a gradient within the Offsite Analysis Area with the most severe elevational changes present at the south end of the Offsite Analysis Area. With the exception of the artesian well and wetland complex (described in detail below) all surface water features within the Offsite Analysis Area have ephemeral to intermittent flow regimes.

During surveys for yellow-billed cuckoo in 2015 (June 19, July 2, July 17, and August 1), the San Pedro River within the offsite mitigation area was dry except during a survey in August 2015, which was conducted immediately following a precipitation event. However, it is not uncommon for the river to flow for extended periods of time in late winter to early spring. Our observations are consistent with other published accounts of the San Pedro River. Cordova et. al (2015) describe the San Pedro River flows as intermittent from the southern boundary of the middle San Pedro Watershed to St. David and as mostly ephemeral from St. David to the northern boundary of the watershed at Redington. During field surveys conducted on July 2, 2015, WestLand biologists measured depth to groundwater using hand dug pits at three locations along the thalweg of the San Pedro River within the boundaries of the Offsite Analysis Area. At the southern end, middle, and northern end of the Offsite Analysis Area, depth to alluvial groundwater on July 2, 2015 was 44, 49, and 53 inches, respectively. In combination with wet/dry mapping conducted by The Nature Conservancy (TNC) along the San Pedro River (TNC 2015), these data indicate that the San Pedro River within the Offsite Analysis Area is not perennial.

The offsite mitigation area includes approximately 115 acres of riparian woodland, 22 acres of fallow agricultural lands, and approximately 7 acres of riparian strand habitat (San Pedro River bottom). The majority of the offsite mitigation area consists of mesoriparian mesquite-dominated woodlands of intermediate age. Throughout most of the woodland (mesquite bosque) habitat, velvet mesquite is the dominant plant species. Along the river terrace, salt cedar (*Tamarix* sp.) becomes locally dominant and these areas are interspersed with mesquite and pockets of mature Fremont's cottonwood (*Populus fremontii*) and Goodding's willow (*Salix gooddingii*). In some portions of the Offsite Analysis Area the mesquite bosque has an understory of scattered graythorn and big sacaton.

The southwest corner of the Offsite Analysis Area has been degraded by active gully and sheet erosion. This portion of the Offsite Analysis Area is relatively open with many areas of bare ground. Total vegetation volume and cover is substantially less then found in much of the rest of the site. Mesquite is widely distributed with four-wing saltbush (*Atriplex canescens*), crucifixion thorn (*Koeberlinia spinosa*), and broom snakeweed (*Gutierrezia sarothrae*) growing between and beneath the mesquite. There is little growth of herbaceous annuals and leaf litter in shrub interspaces in this area.

At the time the HMMP was originally prepared and the Permit issued, the fallow agricultural fields were being actively managed and Sudan grass was the current crop in production. Since that time the fields have been allowed to go fallow. Secondary successional processes have resulted in the establishment of dense stands of mesquite saplings. The density and size of individual mesquite saplings in the north field appears to be more robust than in the southern field.

A leaking artesian well and wetland complex is located just south of the retired agricultural fields. The well is outfitted with a 6-inch-diameter pipe, ball valve, and ¾-inch threaded outlet. Water drips at about ½ gpm from the pipe. Saltcedar and Goodding's willow grow at the perimeter of the wetland. Alkali sacaton (*Sporobolus airoides*) grows down gradient of the leaking artesian well.

In 2005, WestLand measured the vegetation volume in the Offsite Analysis Area (WestLand 2005). Except for the fallowing of the agricultural fields and subsequent secondary successional processes on those fields since these data were collected, there have been no readily apparent, substantive changes within the Offsite Analysis Area. While measured vegetation volume may be higher now than when measured over 10 years ago, the data collected in 2005 illustrate the nature and composition of woodland communities in the Offsite Analysis Area.

In 2005, total vegetation volume of the mesquite woodland was 1.44 ± 0.70 m^3/m^2. Maximum vegetation volume was recorded at two points comprised of mature mesquite (2.01 and 2.04 m^3/m^2, respectively). Minimum vegetation volume was measured in the southwest portion of the mesquite woodland (0.52 m^3/m^2). Maximum canopy height of the mesquite woodland in 2005 was 8.5 meters with an average of 7 ± 1.8 m. Average vegetation volume was greatest at 2 to 4 meters above the ground surface, yet no statistical differences were observed between 0 and 8 meters indicating that vegetation volume was well distributed within the canopy of the mesquite woodland. In 2005, velvet mesquite accounted for 95.5 ± 6.7 percent of the vegetation volume associated with mesquite woodland, occurring at all six transects in the Offsite Analysis Area. Greythorn was measured at two transects and contributed 4 ± 6.7 percent of the total vegetation volume, while catclaw acacia contributed a trace vegetation volume of 0.5 ± 1.2 percent with one observation.

Dominant plant species observed during site visits in 2015 are provided in **Table 1**.

Table 1. Dominant Plant Species Observed at the Offsite Mitigation Parcel During Site Visits

Scientific Name	Common Name
Atriplex canescens	fourwing saltbush
Baccharis salicifolia	seepwillow
Ericameria nauseosa	rabbitbrush
Gutierrezia sarothrae	broom snakeweed
Koeberlinia spinosa	crucifixion thorn
Populus fremontii	Fremont's cottonwood
Prosopis velutina	velvet mesquite
Salix gooddingii	Goodding's willow
Senegalia greggii	catclaw acacia
Sporobolus airoides	alkali sacaton
Sporobolus contractus	spike dropseed
Sporobolus wrightii	big sacaton
Tamarix sp.	saltcedar*
Ziziphus obtusifolia	graythorn

** Considered an exotic species.*

3.5. JURISDICTIONAL DELINEATION

Formal delineation of waters of the U.S. has not previously been conducted on the Offsite Mitigation Parcel; however, a map of the ordinary high-water mark (OHWM) of features that may be considered potentially jurisdictional waters of the U.S. by the Corps under a request for Preliminary Jurisdictional Delineation (Preliminary JD) is included as **Figure 3**. These features include the San Pedro River and the main channel within the actively eroding area (**Figure 3**). The wetland that developed from the leaky artesian well head would not exist without the discharge from the pipe, and as such, are not potentially jurisdictional features. Additionally, the v-shaped erosional features extending off the main channel in the head cutting area are also not potentially jurisdictional waters of the U.S. and are not mapped as such in **Figure 3**. The total area of potentially jurisdictional waters of the U.S. within the Offsite Mitigation Parcel is 8.39 acres.

3.6. PRESENT AND PROPOSED USES OF THE COMPENSATORY MITIGATION SITE AND ALL ADJACENT AREAS

3.6.1. Onsite Mitigation Parcels

Present Uses – The onsite area comprising the Mitigation Parcels (avoided jurisdictional waters of the U.S. and adjacent xeroriparian and upland habitats) are presently used by livestock for grazing. The property is not open to the public.

Adjacent Areas – The area adjacent to the avoided jurisdictional waters of the U.S. and associated, preserved xeroriparian habitat within the Development Project will be developed in accordance with the requirements and conditions of the final CMP. Development will include residential and retail commercial development. Commercial development will occur primarily within ¼ mile of SR 90.

Proposed Uses - The Onsite Mitigation Parcels will be maintained as natural open space with restrictive covenants placed on their land use. These areas will primarily provide for flood flow conveyance and groundwater recharge, migration and dispersal for wildlife, and passive recreational and educational opportunities for local residents with the restrictions outlined above.

3.6.2. Offsite Mitigation Parcel

Present Uses – The Offsite Mitigation Parcel includes both fallow agricultural use and natural areas. Two fallow agricultural fields covering about 22 acres occupy the northwest portion of the Offsite Mitigation Parcel. The remainder of the Offsite Mitigation Parcel is presently in a natural state that consists of mesquite-dominated mesoriparian woodland and an artesian well/wetland complex on the abandoned floodplain, and saltcedar-dominated hydroriparian community along the active floodplain of the San Pedro River.

Adjacent Areas – Land uses of the bottomlands to the immediate north and northeast are a combination of irrigated agriculture and riparian woodlands similar to those on the Offsite Mitigation Parcel. Bottomlands to the south and southeast are largely natural open space consisting of riparian woodlands similar to those present on the Offsite Mitigation Parcel. The northern extent of the San Pedro Riparian

National Conservation Area lies about 1-½ river miles to the south or upstream of the Offsite Mitigation Parcel.

Other nearby landowners maintain their land in a combination of undeveloped open space and agriculture. Recent aerial photographs show the orchards covering small acreages. The open space on these properties may or may not be grazed by livestock. Activities on these lands, residential and commercial development, and/or vegetation changes within the larger watershed are increasing overland flow and discharges to ephemeral drainages that flow across the Offsite Mitigation Parcel. Increased flow velocities during storm events are promoting active head cutting of gullies on the Offsite Mitigation Parcel, as described above.

Proposed Use – Active gullies within the Offsite Mitigation Parcel will be actively managed with the installation of rip rap grade stabilization structures. Saltcedar will be removed from a reclamation area around the artesian well head and wetland and from a reclamation area around the active gullies within the mesquite woodland. The agricultural fields will be restored and native trees will be planted along the active floodplain of the San Pedro River. Aside from these management activities, the Permittee or a designated land steward will manage the Parcel as a natural preserve within the constraints placed on its land use in perpetuity through restrictive covenants.

3.7. REFERENCE SITE(S)

Quantitative measures of production potential of the mesquite woodland have not been established for the Offsite Mitigation Parcel. Potential reference sites exist within ephemeral reaches of the nearby San Pedro River National Conservation Area that will allow for the determination of these measures. The quantitative performance standards established in **Section 6** do contemplate the use of reference sites to establish success criteria. Guidelines for establishing success criteria for the grade stabilization structures have been published in the National Engineering Handbook, Engineering Field Manual, and Conservation Practice Specifications for Arizona (Natural Resources Conservation Service 2002, Soil Conservation Service 1984a, 1984b, 1989).

4. IMPLEMENTATION PLAN FOR THE MITIGATION LANDS

The Onsite Mitigation Parcels (avoided jurisdictional waters of the U.S. and associated xeroriparian habitat) will be maintained in a natural condition and preserved via restrictive covenants; habitat establishment, restoration, or enhancement of these areas is not planned.

Habitat restoration is planned for the Offsite Mitigation Parcel. The following paragraphs outline the implementation plan for restoration of specific degraded or disturbed areas. These activities are shown in **Figure 4**. And described in greater detail in the implementation plan provided as **Appendix B**.

Active head cut erosion is an on-going problem contributing to habitat degradation and water quality concerns. The advancing head cut will be stabilized through construction of a rock chute at the head cut and installation of rip rap in the channel immediately downgradient of the new chute (**Figure 4**). With these treatments, the gullies will naturally heal over decades until they attain a new equilibrium. Treating these problems will remove or reduce the problems described above. Planting of native trees and shrubs, and seeding with a native seed mix in a reclamation area (**Figure 4**) around these activities will provide for enhancement of the surrounding mesquite-dominated habitat.

Removal of saltcedar, planting of native trees and shrubs, and seeding with a native seed mix in a reclamation area (**Figure 4**) around the leaking artesian well and its associated wetland will enhance this existing habitat. Construction of new barbed wire fence along the southwestern edge of the parcel (**Figure 4**) will provide protection to the wetland and surrounding area from cattle trespass onto the parcel.

The fallow agricultural fields (**Figure 4**) have naturally revegetated with native mesquite. In some areas where appropriate, weeds will be removed from the former agricultural fields and the existing mesquite trees will remain undisturbed and some areas of the fallow fields will be enhanced by additional plantings of native trees and shrubs, tilled, and, seeded with a native seed mix. The corral and associated outbuilding will be removed to improve the natural aesthetic of the Offsite Mitigation Parcel. Tilling and seeding of the compacted area around the corral will improve the hydraulic conductivity of the soil and root penetration for recolonizing vegetation, and will increase the acreage of mesquite woodland within the Offsite Mitigation Parcel.

Planting and preservation of native riparian trees and shrubs in the active floodplain along the San Pedro River channel will promote sediment deposition and the aggradation of floodplain terraces during overbank flow events. In the absence of catastrophic flooding and erosion, the aggradation of these floodplain terraces will facilitate the succession of these environments to mesquite woodland.

4.1. RATIONALE FOR EXPECTING IMPLEMENTATION SUCCESS

Implementation of this plan on the Onsite Mitigation Parcels consists of recordation of restrictive covenants as required by the special conditions. Given the straightforward nature of this obligation, compliance with the special conditions and restrictive covenants is expected.

The nature and type of habitat to be restored is generally similar in structure to the mesoriparian habitats that exist along similar geomorphic landforms outside the Offsite Mitigation Parcel on adjoining private lands

and nearby San Pedro Riparian National Conservation Area. The basic natural processes that support mesquite woodland are still in place (e.g., depth to groundwater, hydrology, and soils). This is evident by the natural establishment of mesquite in the fallowed agricultural fields. The primary factor affecting the productivity potential of the mesquite woodland on the Offsite Mitigation Parcel is time since disturbance. In the absence of future disturbance (e.g., fire), the mesquite woodland will achieve its potential.

Successful restoration of the farm fields to mesquite woodland is expected because the adjoining mesquite woodland has largely recovered from its prior disturbance state following land clearing.

Through construction of the rip rap grade control structures, we expect to successfully curtail head cut erosion, which will prevent further habitat degradation in the southwestern portion of the Offsite Mitigation Parcel. Productivity within the mesquite woodland will be stabilized and enhanced as the gullies heal over time. Although the potential exists for these structures to fail, causing further erosion, active monitoring and maintenance will reduce the probability of occurrence. Any structures that fail will be reinstalled at the most suitable location for achieving future success.

4.2. RESPONSIBLE PARTY

All phases of the implementation plan for the Mitigation Parcels will be the responsibility of El Dorado, subject to transfer as provided in the restrictive covenants.

4.3. SCHEDULE

Recordation of restrictive covenants will be governed by the special conditions of the reinstated CWA Section 404 permit. El Dorado or its assigns will implement the excavation, grading, and construction activities to restore proper slope and channel morphology of sites with active gully erosion on the abandoned floodplain within the Offsite Mitigation Parcel. At no time will heavy equipment be operated in the river. El Dorado (or its assigns) plan to initiate these erosion control measures shortly after the Corps reinstates the permit for the proposed action (the Project) subject to any seasonal restrictions that arose during consultation with the U.S. Fish and Wildlife Services.

4.4. SITE PREPARATION AND IMPLEMENTATION

4.4.1. Site Fencing

New four-strand barbed wire fence, bottom strand barb-less, will then be constructed along the perimeter of the Offsite Mitigation Parcel (**Figure 4**) to provide a means of protection from unauthorized vehicular access, illegal dumping, and wood cutting, and to limit access to livestock. Due to safety concerns, fencing will not be placed across the river at upstream and downstream locations or along the margins of the abandoned floodplain on both sides of the river.

4.4.2. Gully Repair

4.4.2.1. Erosion Control

At the Offsite Mitigation Parcel, site preparation activities will focus on grading, excavation, and construction of erosion control structures at the active head cut (**Figure 4**). Excavation and grading activities will be necessary to reestablish an appropriate channel slope and dissipate the energy of overland and flood flows to gullies. To the extent possible, excavated material will be retained on site: any excess materials will be removed from the site and properly disposed. Prior to initiating earthmoving activities within the Offsite Mitigation Parcel, temporary clear-limit fences will be constructed at key locations to protect nearby native vegetation. Accessing some gullies with heavy equipment may require selective cutting and trimming of vegetation in route to the sites. Efforts will be made to minimize impacts to extant native vegetation.

4.4.2.2. Saltcedar Removal

Removal of saltcedar, planting of native trees and shrubs, and seeding with a native seed mix in the reclamation area (**Figure 4**) around these gully repair activities will provide for enhancement of the surrounding mesquite-dominated habitat. One of two methods of saltcedar removal may be employed, as appropriate: 1) cut stump/herbicide application, or 2) mechanized removal. Under the "cut-stump" method, tree trunks are cut horizontally at ground level followed and immediately (within 30 seconds) by application of a 2:1 mixture of water and herbicide. A dye is added to the herbicide mixture to clearly differentiate between stumps that have been treated and those in need of herbicide application. Plant material (slash) is collected, piled, and removed from the site. In areas where saltcedar grows in or near water, the same procedures are followed, except that only aquatic-approved herbicide is applied to cut stumps. Mechanized removal may be the best solution in areas where saltcedar grows in large, single-species patches requiring control and removal. Combinations of bulldozing, root-plowing, and eventual burning of debris may be used to clear the area of vegetation. These techniques delay and reduce the need for herbicide treatment as part of the control effort.

4.4.2.3. Planting Plan

Planting in the reclamation area around the gully repair activities will include a combination of container-grown plants and direct seeding of trees, shrubs, and grasses common to the adjacent mesquite woodland (e.g., velvet mesquite, alkali sacaton, and giant sacaton) across the reclamation area (**Figure 4**). Plants will be installed in a randomized fashion in appropriate field-determined locations.

4.4.2.4. Irrigation Plan

Driwater or similar supplementation will be utilized to establish the containerized plants. Seeds of trees, shrubs, and grasses sown on the revegetation area would meet their moisture requirements via ambient rainfall.

4.4.3. Artesian Well/Wetland Enhancement

The artesian well and wetland complex will be enhanced and protected via removal of saltcedar, planting of native trees and shrubs, and seeding with a native seed mix in a reclamation area (**Figure 4**) around the leaking artesian well and its associated wetland will also enhance this existing habitat. Construction of

new barbed wire fence along the southwestern edge of the parcel (**Figure 4**) will provide protection to the wetland and surrounding area from cattle trespass onto the parcel.

4.4.3.1. Saltcedar Removal

Removal of saltcedar will occur via one of two methods of saltcedar removal described above. In areas where saltcedar is growing in or near any open water present in the wetland, only aquatic-approved herbicide is applied to cut stumps.

4.4.3.2. Planting Plan

See implementation plan provided as **Appendix B**. Planting in the reclamation area around the leaking artesian well and its associated wetland will include a combination of container-grown plants and direct seeding of trees, shrubs, and grasses common to more hydroriparian habitats (e.g., cottonwood, desert willow, Arizona walnut), as well as velvet mesquite, within the reclamation area (**Figure 4**). Plants will be installed in a randomized fashion in appropriate field-determined locations.

4.4.3.3. Irrigation Plan

Driwater or similar supplementation will be utilized to establish the containerized plants. Seeds of trees, shrubs, and grasses sown on the revegetation area would meet their moisture requirements via ambient rainfall.

4.4.4. Active Restoration of the Agricultural Fields

4.4.4.1. Planting Plan

The passive restoration and active enhancement of the fallow agricultural fields within the Offsite Mitigation Parcel has been initiated by natural establishment of mesquite throughout much of the 22-acre area. This natural establishment will be supplemented through herbaceous weed removal and protection of existing mesquites on all former agricultural areas, and by planting a combination of container-grown plants and direct seeding trees, shrubs, and grasses common to the adjacent mesquite woodland (e.g., velvet mesquite, alkali sacaton, and giant sacaton) in the southern portion of these areas (**Figure 4**). Plants will be installed in a randomized fashion at densities approximating those of the nearby mesquite woodland Current tree densities have not been measured but are expected to exceed 150 trees per acre based upon casual observation. Stromberg (1993), summarizing other studies from Arizona, reported that high density mesquite woodlands are composed of 200-800 individuals per hectare or 80-325 plants per acre). The number of mesquite per acre currently found in the fallow fields are expected to substantially exceed the lower density values reported and these values will be supplemented in the southern field by additional plantings.

4.4.4.2. Irrigation Plan

Driwater or similar supplementation will be utilized to establish the containerized plants. Seeds of trees, shrubs, and grasses sown on the revegetation area would meet their moisture requirements via ambient rainfall.

4.4.5. Active Enhancement of the River Floodplain

Planting and preservation of native riparian trees and shrubs in the active floodplain along the San Pedro River channel will promote sediment deposition and the aggradation of floodplain terraces during overbank flow events. In the absence of catastrophic flooding and erosion, the aggradation of these floodplain terraces will facilitate the succession of these environments to mesquite woodland.

4.4.5.1. Planting Plan

Planting in the active floodplain includes planting container-grown native trees. Areas within the edge of the intermittent river channel (**Figure 4**) will be planted with 400 5-gallon cottonwood trees, planted with the rootball at least 4 feet below the ground surface and as close to the water table as possible. Areas outside the channel but within the active floodplain (**Figure 4**) will be planted with a mix of 1,000 1-gallon mesquite and netleaf hackberry. Plants will be installed in a randomized fashion in appropriate field-determined locations.

4.4.5.2. Irrigation Plan

Driwater or similar supplementation will be utilized to establish the containerized plants on floodplain terraces. No supplemental watering is proposed for cottonwood plantings.

4.5. AS-BUILT CONDITIONS

All of the Mitigation Parcels will be under the protection of restrictive covenants. The Offsite Mitigation Parcel will receive new perimeter fences protecting the artesian well/wetland complex and the fallow agricultural fields. The agricultural fields and nearby disturbed areas will be restored to mesquite woodland, and connect with the woodland to the immediate south. The erosion control features will reduce or eliminate active gully erosion migrating through the Offsite Mitigation Parcel, which will preclude further habitat degradation and facilitate the maturation of the existing intermediate age mesquite woodland to mature woodland with a closed canopy.

The as-built condition of the erosion control structures and plantings within the agricultural fields will be certified by a professional engineer and/or Landscape Architect as appropriate and submitted to the Corps within 45 days of fully implementing these efforts. The Corps will inspect the newly constructed boundary and interior fences of the Offsite Mitigation Parcel within 45 days of completion, or elect to receive proof of the as-built condition of the fences by way of photographic documentation, receipts and written description of the work accomplished.

5. MAINTENANCE ACTIVITIES DURING THE MONITORING PERIOD

5.1. MAINTENANCE ACTIVITIES

The following maintenance activities will occur on the Mitigation Parcels:

1. inspection and repair fences at Offsite Mitigation Parcel, as required;
2. inspection of rip rap grade control structures for eroded areas at the Offsite Mitigation Parcel, and repairs, as required;
3. inspection of ephemeral washes within the Development Project for unauthorized off-road vehicular activity and treatment of problem areas, as required; and
4. inspection and removal of trash and debris that collect on the Mitigation Lands.

5.2. RESPONSIBLE PARTY

El Dorado, contractors or its designees will make routine inspections and address management issues in the ephemeral washes corridor within the Mitigation Lands. El Dorado, contractors, or designated land stewards will perform the removal of existing dilapidated fences, installation and maintenance of new boundary and interior fences, and design and install the erosion control structures within the Offsite Mitigation Parcel. Maintenance, repairs, and replacement of the fences will take place in perpetuity. Maintenance and repair of the erosion control structures will occur as needed over the 5-year monitoring period.

5.3. SCHEDULE

El Dorado or its assigns will inspect and repair fences, and remove trash and debris within the Offsite Mitigation Parcel on a quarterly basis. Inspection and repair of the erosion control structures will take place on a monthly basis during the summer and winter rainy seasons (July-March). Inspection and control of unauthorized vehicular access of the protected ephemeral washes within the Mitigation Lands will occur for all washes during each quarter of the year in perpetuity.

6. MONITORING PLAN AND PERFORMANCE STANDARDS FOR COMPENSATORY MITIGATION SITE

6.1. TARGET FUNCTIONS AND VALUES

The avoided jurisdictional washes will continue to provide their existing ecological functions and values (described above) once they are preserved in perpetuity with the appropriate restrictive covenants. Maintenance of these functions and values (e.g., flood flow conveyance and groundwater recharge, migration and dispersal for wildlife) will be dependent on the active oversight and management of these areas within the larger development area by Whetstone or designated land stewards.

Similarly, the associated xeroriparian habitat, preserved within the Primary and Secondary buffer zones, will continue to provide the existing ecological functions and values once they are preserved in perpetuity with the appropriate restrictive covenants. Maintenance of these functions and values will likewise be the responsibility of El Dorado or its assigns.

Within the Offsite Mitigation Parcel, the functions and values of the primary native vegetation habitats found on the site (mesquite woodland and the artesian well/wetland complex) will be maintained and enhanced through acquisition of and preservation of the land via restrictive covenant and through the active restoration and enhancement of the site. Preservation of the mesquite woodland on the Offsite Mitigation Parcel, and protections gained from actively controlling head cut erosion, will promote the woodland's maturation to a closed canopy. Mature mesquite woodlands, or bosques, cover a fraction of the acreage that they occupied in pre-settlement times in the southwest. These woodlands provide important avian habitat, and an abundant, nutritious food source for a variety of birds and mammals, and security cover for large wildlife species.

The retired agricultural fields will be actively restored to establish a mesquite woodland. The adjoining mesquite woodland has recolonized the area it occupied prior to land clearing. In time, these retired agricultural fields will provide the functions and values of the adjacent mesquite woodland.

Arresting the migration of the active head cut on the Offsite Mitigation Parcel will preclude habitat degradation within the mesquite woodland and allow it to reach its production potential and values as described above. Curbing soil erosion generated from these gullies will also improve downstream water quality and reduce sediment deposition into waters of the U.S.

The preservation, maintenance, and enhancement of the artesian well/wetland complex will provide a perennial water source to wildlife. Furthermore, these activities will ensure the endurance of a plant community that is poorly represented in the region, where most of the perennial wetlands were lost following channel incision and associated groundwater declines in the late 1800s.

Total vegetation volume for the xeroriparian habitat within the Development Project that are supported by the ephemeral flows through the jurisdictional waters in the project area are 0.54 ± 0.16 m^3/m^2 (WestLand Resources, Inc. 2005) while those of the mesquite woodland habitats within the Offsite Mitigation Parcel are 1.4 ± 0.7 m^3/m^2, an approximately 2.6-fold difference. The Offsite Mitigation Parcel will provide 144 acres of preserved/restored habitat that, at maturity, will support a vegetation community with

approximately 2.6 times the volume of vegetation found associated with the waters of the U.S. on the Development Project. Both the size of the Offsite Mitigation Parcel and the increased productivity of the habitats on this site provide sufficient compensation for potential impacts to the waters of the US on the Development Project and associated impacts to lost functions and values that will result from the implementation of the Project.

The target hydrological regime for the Mitigation Lands (both Onsite and at the Offsite Mitigation Parcel) is their current condition. Negligible changes to the hydrological regime are anticipated as a result of activities associated with the compensatory mitigation effort. Restoration of the gully areas will not significantly change the hydrologic regime, but will restore it to a more natural condition.

6.2. TARGET JURISDICTIONAL AND NON-JURISDICTIONAL AREAS TO BE ESTABLISHED, RESTORED, ENHANCED, AND/OR PRESERVED

The Onsite Mitigation Parcels, including both avoided jurisdictional and non-jurisdictional areas (1,624 acres total), will be preserved by restrictive covenants.

Within the Offsite Mitigation Parcel, the artesian well and wetland complex, although not jurisdictional, will be protected from inadvertent livestock grazing. Control of head cutting within the main erosion channel will enhance and preserve a potentially jurisdictional area of 8.39 acres within this feature.

The intermediate aged mesquite woodland on the Offsite Mitigation Parcel will be allowed to further develop into more productive mature mesquite woodland on about 77 acres of non-jurisdictional area, with preservation and erosion control habitat enhancement measures.

The mesquite scrubland in the southwestern portion of the Offsite Mitigation Parcel will likely remain unchanged at 7.1 acres of non-jurisdictional area, even with stabilization of the head cuts. The productivity of this area is either affected by long-term sheet erosion, soil moisture reductions due to the redirection of subsurface moisture towards the head cuts, or inherent soil conditions.

Actively restoring the agricultural fields to mesquite woodland habitat type will increase the extent of this vegetation community by about 22 acres of non-jurisdictional area on the Offsite Mitigation Parcel, in addition to reducing habitat fragmentation of this riparian community along this reach of the river.

Disturbed areas to the south of the agricultural fields and the corral on the Offsite Mitigation Parcel will also be actively revegetated to facilitate the establishment of mesquite woodland or scrubland (2.2 acres of non-jurisdictional area).

Planting and preservation of native riparian trees and shrubs in the active floodplain along the San Pedro River channel will enhance and preserve the riparian fringe of this feature, a potentially jurisdictional area of 8.39 acres.

6.3. MONITORING METHODS

6.3.1. Operation and Management Monitoring

All phases of operations and management monitoring of the Offsite Mitigation Parcel, and the protected ephemeral washes within the Onsite Mitigation Parcels, will be the responsibility of El Dorado subject to transfer as provided in the restrictive covenants.

6.3.1.1. Human Use and Impact Assessment

During each of the fence line inspections on the Offsite Mitigation Parcel, and general inspections of the Onsite Mitigation Parcels, the inspector shall make note of development of trails or other human uses such as illegal dumping, camping, or other human activities that adversely affect ecological functions. The problems encountered and the corrective actions taken to address them will be summarized in the annual monitoring report.

6.3.1.2. Maintenance Monitoring and Repair of Erosion Control Structures at the Offsite Mitigation Parcel

During each inspection of the erosion control structures on the Offsite Mitigation Parcel, the inspector shall make note of any problems that may cause the structures to fail and address them as soon as practicable. As noted above, inspections will take place on a monthly basis during the winter and summer rainy seasons when the structures are most likely to receive flood flows and require repairs. The problems encountered and the corrective actions taken to address them will be summarized in the annual monitoring report.

6.3.2. Ecological Functions & Values Monitoring for the Offsite Mitigation Parcel

6.3.2.1. Woody Vegetation Monitoring

Standard plotless sampling methods (point centered quarter and total vegetation volume) will be used within the revegetated agricultural fields and the extant mesquite woodland south of the fields on the Offsite Mitigation Parcel to document baseline condition within one year of permit reinstatement. Data collected using these sampling methods will include stem density, basal diameter by woody plant species and vegetation volume data. Vegetation sampling and analysis will take place in year one, three and five of the monitoring period to track the progress of the restoration effort on the abandoned agricultural fields relative to the baseline condition and condition of the Mesquite Bosque in 2005 as established during initial development of the HMMP.

Total Vegetation Volume. Total vegetation volume (MacAuthor and Horn 1969, Mills et. al. 1989, Mills et. al. 1991) field measurments will be collected along random transects established within each of the monitoring areas. At 2-m intervals along each transect, a 6-m pole marked in decimeter (dm) and meter sections is held vertically. A “hit” is recorded for each dm above the ground in which vegetation occurs within 1-dm of the pole. The number of hits possible within each meter layer above the ground ranges from 0 to 10 – no more than one hit is possible for each dm segment. Only one species is recorded when more than one species occurs within a single cylinder – determining which species to record is a field judgement and is typically based upon the relative dominance of the species in question. Other plant

species observed in the transect vicinity, but not hit during sampling, will also be recorded. Voucher specimens will be collected for all species whose identification is uncertain.

This technique essentially samples a series of cylinders 1-dm high with a 1-dm radius from the ground surface through the top of the vegetative canopy, and records the presence or absence of woody perennial vegetation within each 3.1415 dm^3 cylinder, effectively documenting the species and structural diversity of the plant community.

Within each transect, vegetation analysis will include calculation of a vegetation volume index (VV) by 1-m layer increments (ground-1 m, 1-2 m, 2-3 m, 3-4 m, 4-5 m, 5-6 m, 6-7 m, 7-8 m, and >8 m), TVV index, a VV index by species ($VV_{(s)}$), woody perennial vegetation species richness (the number of species hit during sampling and the number of species observed in the transect vicinity), and herbacious plant cover. The TVV for each transect is calculated by assuming that:

> $\sum h$ represents the number of dm^3 of vegetation found within the $n*dm^2$ area sampled along the transect. Where h = the number dm layers with vegetation (hits) and n = the number of sample points along the transect. Therefore, the sum of "hits" (number of dm layers with vegetation) provides an index of the volume of vegetation per square dm area is:
>
> $$\sum_{1}^{n} h = (x\ dm^3) / (n\ dm^2)$$
>
> Total vegetation volume index as cubic meters of vegetation per square meter (as reported in scientific literature) is then calculated as:
>
> $$TVV = [(x\ dm^3) / (n\ dm^2)]*(1m^3/1000dm^3)*(100dm^2/1m^2)$$
> or
> $$TVV = \sum h/(10n)$$

This equation can then be simply modified to document the vertical distribution of vegetation and species composition within the measured plant community by summing the number of hits (h) by canopy layer, species, or a combination of both.

Point Centered Quarter. At each sample point along the randomly located transect within each of the monitoring areas that require collection of density and basal area data, data will be collected using point-centered quarter (Mueller-Dombois and Ellenberg 1974). Point-centered Quarter Sampling Method four quarters will be established at each sample point. At each sample point, the following was measured:

- The distance (to the nearest decimeter) to the midpoint of the nearest woody perennial tree or shrub in each quarter.
- The basal diameter (in centimeters [cm], to the nearest 0.5 cm) of each of the stems of the nearest individual tree or shrub. Basal measurements were taken directly above the root crown.

Data collected via point-centered quarter sampling will provide information on woody perennial trees and shrubs within the site. These data were analyzed to derive the following quantitative parameters for each sampled species: frequency, density, dominance, and basal area. Descriptions of each of these quantitative parameters, and their derivations, are provided below.

Line Intercept. Modified line intercept measurement of plant cover (*sensu* Canfield 1941) will be used in the Gully Repair/Erosion Control portions of the project to measure basal cover. This method uses transects and measures the intercept of that transect line with vegetation. The method can provide either or both canopy cover and basal cover. For purposes of monitoring progress towards stabilization of sheet erosion areas collection of only basal cover data is proposed. It can be more consistently measured and reflects the percentage of soil surface occupied by vegetation. Basal cover data for grasses and forbs will be collected at every odd-numbered foot along each transect. At each sampled point along the transect, a plumb line will be used to identify vegetation above ground-level (canopy cover) and vegetation at ground-level (basal cover). All vegetation intersected by the plumb line will be identified by life form (grass or forb) to species, if possible. At many points, the plumb line did not intersect vegetation above ground-level. If no vegetation was intersected at ground-level, the material intersected by the plumb line at ground level will be recorded as follows:

- Bare – bare soil with no organic, rock, or gravel cover;
- Gravel – solid inorganic material less than 2 inches and greater than ¼ inch in diameter;
- Litter – non-living plants/ground debris/litter, including scat;
- Scat – feces of various wildlife, mostly mammalian, species; or
- Rock – solid inorganic material greater than 2 inches in diameter.

For data analysis and presentation, basal cover, and the cover of each material described above will first be calculated for each transect and then averaged across transects within a site. Photographs of the longitudinal axis of each transect will also be taken to document vegetation conditions at that portion of the site to allow comparisons with comparable transect photographs from prior years.

Permanent Photo Points. Permanent photo points will be established throughout the mitigation site. Photographs will be collected from these points to provide qualitative documentation of site condition and development. Permanent photo-points will be established within the main channel of the San Pedro River, at selected points within and on the perimeter of the Offsite Mitigation Area, and at the abandoned agricultural field. From 10 to 15 permanent photo-points will be established. Photographs will be taken at yearly intervals to provide visual documentation of habitat development during the five-year monitoring period.

6.3.3. Quantitative Performance Standards for Offsite Mitigation Area

6.3.3.1. Gully Repair/Erosion Control Structure.

The effectiveness of the Erosion Control Structures will be evaluated qualitatively by ground photos and field notes from site inspections and quantitatively by measurement of plant community response to stabilization efforts. Over the five years of planned monitoring activities, success will be demonstrated through documentation of structure integrity and qualitative documentation of channel stability and

vegetation establishment within the currently affected areas. The function of the structural erosion control measures shall be quantitatively documented as follows:

- Rock erosion control features. On an annual basis the feature shall be inspected to ensure that the head cut has not bypassed or undermined the structure. The extent of any erosion will be measured and volume of rock required to stabilize the structure shall be quantified and repair documented. Three years without any documented failures or requirements for repair to the rock structure shall be deemed successful.
- A component of this project involves placement of straw waddle, seeding, and tree planting in areas that are subject to active sheet erosion. Restoration in these areas will be deemed successful when measured basal cover of herbaceous vegetation (grasses and forbs) is 15 percent or greater and uniformly distributed across the site as documented by ground photos.
- Fifty percent survival of planted trees one year after driwater or similar water supplementation has ceased being applied.

6.3.3.2. Artesian Well/Wetland Enhancement

Success of enhancement efforts within the Artesian Well/Wetland Enhancement area is based on the establishment of a positive trend towards the desired target functions and values. Trends in the development of plant community structural characteristics will be used to document that the restored agricultural fields are proceeding towards targeted functions and values. Success will be determined after a statistically meaningful trend in plant community development has been established using measured stem density, basal area, and total perennial woody vegetation volume. Our expectation is that both basal area and perennial woody vegetation volume will increase over the monitoring period. Plant density may or may not increase during this period, but will help inform interpretation of other collected vegetation data.

Data collection will be accomplished using randomly located vegetation transects within the Artesian Well/Wetland Enhancement area. Along each transect point center quarter will be used to collect plant density, species composition, and basal area data. Along the same randomly located transects vertical line intercept will be used to collect vegetation volume data by species. Success will be determined when over a five-year period there is:

- A statistically meaningful positive trend in the measured values of community structure, and
- tamarisk does not exceed 5 percent of the total woody vegetation basal area.

6.3.3.3. Active Restoration of Agricultural Fields

Success of restoration efforts within the restored agricultural fields will be based on the establishment of a positive trend towards the desired target functions and values. Trends in the development of plant community structural characteristics will be used to document that the restored agricultural fields are proceeding towards targeted functions and values. Success will be determined after a statistically meaningful trend in plant community development has been established using measured stem density, basal area, and total perennial woody vegetation volume. Our expectation is that both basal area and perennial woody vegetation volume will increase over the monitoring period. Plant density may or may not increase during this period, but will help inform interpretation of other collected vegetation data.

Data collection will be accomplished using randomly located vegetation transects within the fallow agricultural areas. Along each transect total vegetation volume and plant density data using point center quarter will be collected. Success will be determined when over a five-year period there is:

- A statistically meaningful positive trend in the measured values of community structure, and
- tamarisk does not exceed 5 percent of the total basal area.

6.3.3.4. Active Enhancement of the River Floodplain

The success of the active enhancement of the river floodplain will be documented based upon the survival of planted trees. Success will be determined when over a five-year period there is:

- Fifty percent survival, 700 of the 1,400, plants to be planted pursuant to the implementation plan (Plantings include 400 cottonwoods along the intermittent river channel and 1,000 of a mix of mesquite and net leaf hackberry on the floodplain terrace above the active channel).

6.3.4. Monitoring Schedule

The schedule provided is for a 5-year monitoring period. Human Use and Impact Assessment will occur at least once per quarter throughout the 5-year monitoring period. Generally, the Ecological Functions and Values Monitoring and Photographic Documentation will be based upon the following:

- Wood Vegetation Community Structure and Composition at the offsite mitigation parcel. This will occur in year one, year three, and year five of the monitoring period. Sampling will occur at the end of the monsoon rainy season (September-October).
- Photographic Documentation for the offsite mitigation parcel. Permanent photo points will be established during the first year of operations at the time that baseline vegetation data are collected. Photographic documentation will be completed annually throughout the 5-year monitoring effort.
- Annual monitoring will be ongoing until all sites have met the established success criteria or for a period of five years, whichever is greater. Quantitative measures to document achievement of performance standards will occur on odd years and will only be required for those aspects of the site that have not achieved their success criteria.

6.3.5. Annual Monitoring Reports

By the end of the fourth quarter of each year, a digital copy of an annual report will be submitted to the Corps that will describe the current state of each mitigation area and summarize the maintenance and monitoring efforts completed during the reporting year as required by this Habitat Monitoring and Mitigation Plan. The monitoring reports will not be exhaustive, but will summarize the maintenance and monitoring activities of the current year. The reports will transmit information gathered as required by this monitoring plan in a form that allows the Corps to make informed determinations about the success of protection, enhancement, and restoration efforts on the Mitigation Lands.

7. COMPLETION OF COMPENSATORY MITIGATION

7.1. NOTIFICATION OF COMPLETION

El Dorado or its assigns will provide written notification of completion to the appropriate representative of the Corps' Los Angeles District. Notification of completion can be provided for individual elements of the mitigation effort singly, in groups, or all at once. Once notification of completion has been submitted to the Corps and the Corps confirms its acceptance (see **Section 7.2**), acts of God or other acts outside of El Dorado's control that impair or damage the site (except for fence repair and maintenance) shall not require repair or update by El Dorado or its assigns to restore site condition.

7.2. AGENCY CONFIRMATION

The compensatory mitigation will not be considered complete until the appropriate representative of the Corps' Los Angeles District confirms that it is complete, based upon review of the monitoring reports and/or during site inspection.

8. CONTINGENCY MEASURES

8.1. INITIATING PROCEDURES

Success and/or failure to achieve the objectives identified for the Mitigation Lands will be detailed in the yearly monitoring reports submitted to the Corps. In these reports, El Dorado, or its assigns will identify the degree to which success has been achieved, the likely cause of any failure and, if necessary, propose alternative measures for achieving mitigation success. Should contingency measures become necessary, the responsible party (or designee) will schedule a meeting with the Corps to develop alternative measures and an implementation schedule for achieving successful mitigation.

8.2. ALTERNATIVE LOCATIONS FOR CONTINGENCY COMPENSATORY MITIGATION

The mitigation actions set forth in previous sections, particularly those of the gully erosion control structures, are not likely to require the utilization of alternative mitigation locations as long as prescribed regional and national engineering specifications and guidelines are followed during construction and maintenance.

8.3. RESPONSIBLE PARTY

Completion of the compensatory mitigation plan for the Onsite and Offsite lands will be the responsibility of El Dorado, subject to transfer as provided in the restrictive covenants.

9. LITERATURE CITED

Canfield, R.H. 1941. Application of the line interception method in sampling range vegetation. J. Forestry 39:388-394.

MacAurthur, R.H. and H.S. Horn. "Foliage Profile by Vertical Measurements. Ecology 50(1969): 802-804.

Mills, S.G., J.B. Dunning, and J.M. Bates. 1989. Effects of urbanization on breeding bird community structure in southwestern desert habitats. The Condor 91:416-428.

Mills et al. 1991. The Relationship between Breeding Bird Density and Vegetation Volume. Wilson Bulletin 103(3):468-479.

Mueller-Dombois, D & Ellenberg, H. 1974. Aims and Methods of Vegetation Ecology. John Wiley & Sons, Inc.

Natural Resources Conservation Service. 2002. Conservation Practice Standard: Arizona. Grade stabilization structure (Code 410). NRCS Field Office Technical Guide, Section IV. July 2002.

The Nature Conservancy. (2015). San Pedro River Wet-Dry Maps. 2015 Wet-Dry Maps (updated 10/29/2015). http://azconservation.org/downloads/san_pedro_wet_dry_mapping.

Soil Conservation Service. 1984a. Engineering Field Manual for Conservation Practices: Chapter 6 - Structures. 99 pp.

Soil Conservation Service. 1984b. Engineering Field Manual for Conservation Practices. Chapter 10: Gully treatment. 16 pp.

Soil Conservation Service. 1989. Engineering Standard: Arizona. Grade stabilization structure – natural materials (Code 410-A-1). January 1989. 8 pp.

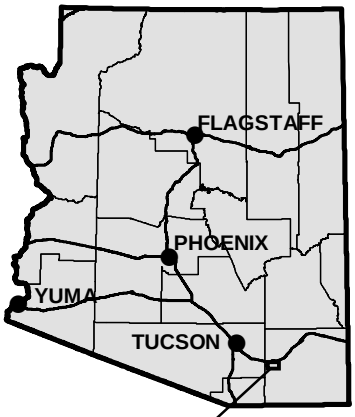
Stromberg, J.C. 1993. Riparian mesquite forests: a review of their ecology, threats, and recovery potential. Journal of the Arizona-Nevada Academy of Science 27(1):111-124.

SWCA, Inc. (SWCA) 1993. Riparian habitat definition and classification system technical report. Prepared for Pima County Department of Transportation and Flood Control District, dated October 1993.

WestLand Resources, Inc. (WestLand) 2005. Vegetation Volume Determinations: Whetstone Ranch Property and Offsite Mitigation Parcel. A technical memorandum prepared for Whetstone Partners, LLP and dated September 29, 2005.

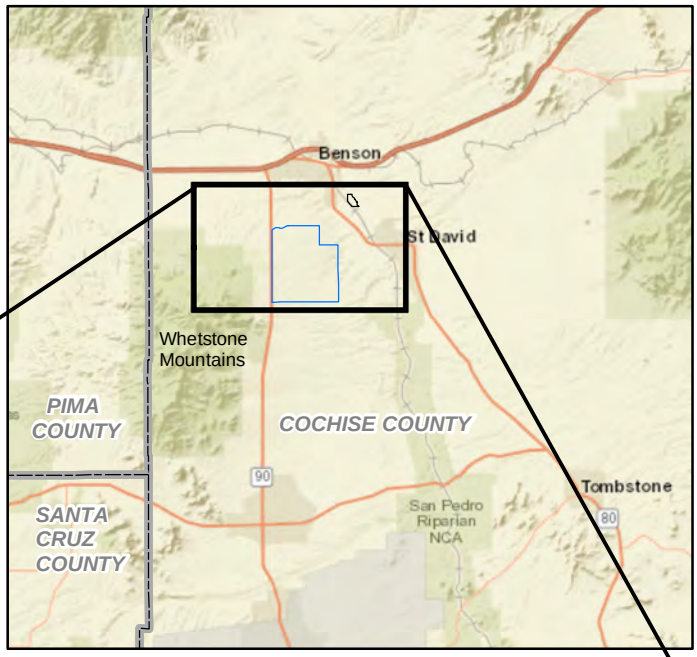
FIGURES

ARIZONA

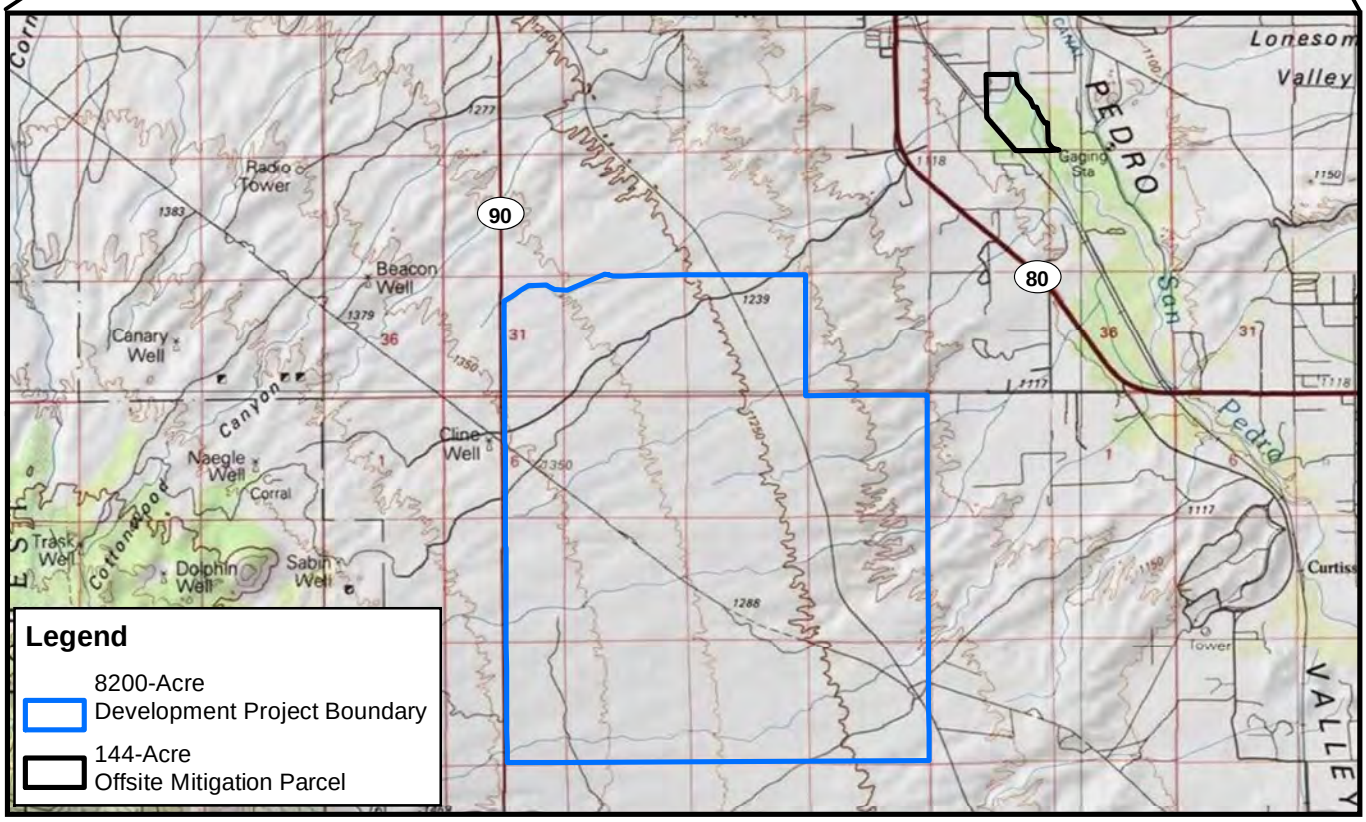


PROJECT LOCATION

Benson, Arizona



Approximate Scale 1 Inch = 10 Miles



T17S, R20E, Portions of Sections 23, 24, 31, 32, and 33
T18S, R20E, Portions of Sections 3-10, and 15-18
Cochise County, Arizona,
USGS Fort Huachuca 1:100,000 Quadrangle
Data Source: RBF and Rick Engineering

N

0 4,000 8,000 Feet

0 1,000 2,000 Meters

WestLand Resources

PHASE 1 OF THE VILLAGES AT VIGNETO

Habitat Mitigation and Monitoring Plan
(ACOE File No. 2003-00826-SDM)

VICINITY MAP

Figure 1

Path: M:\Jobs\400's\460.93\ENV\HMMP\Figure2.mxd Date: 12/18/2017 User: rwitzke

BUCK HORN DR

HOLLYHOCK LN

RIVER RD

Legend

144-Acre Offsite Mitigation Parcel

T17S, R20E, Portions of Sections 23 and 24
Cochise County, Arizona,
Image Source: 2015 USDA NAIP Orthophoto
Data Source: RBF and Rick Engineering

WestLand Resources

N

0 200 400 Feet

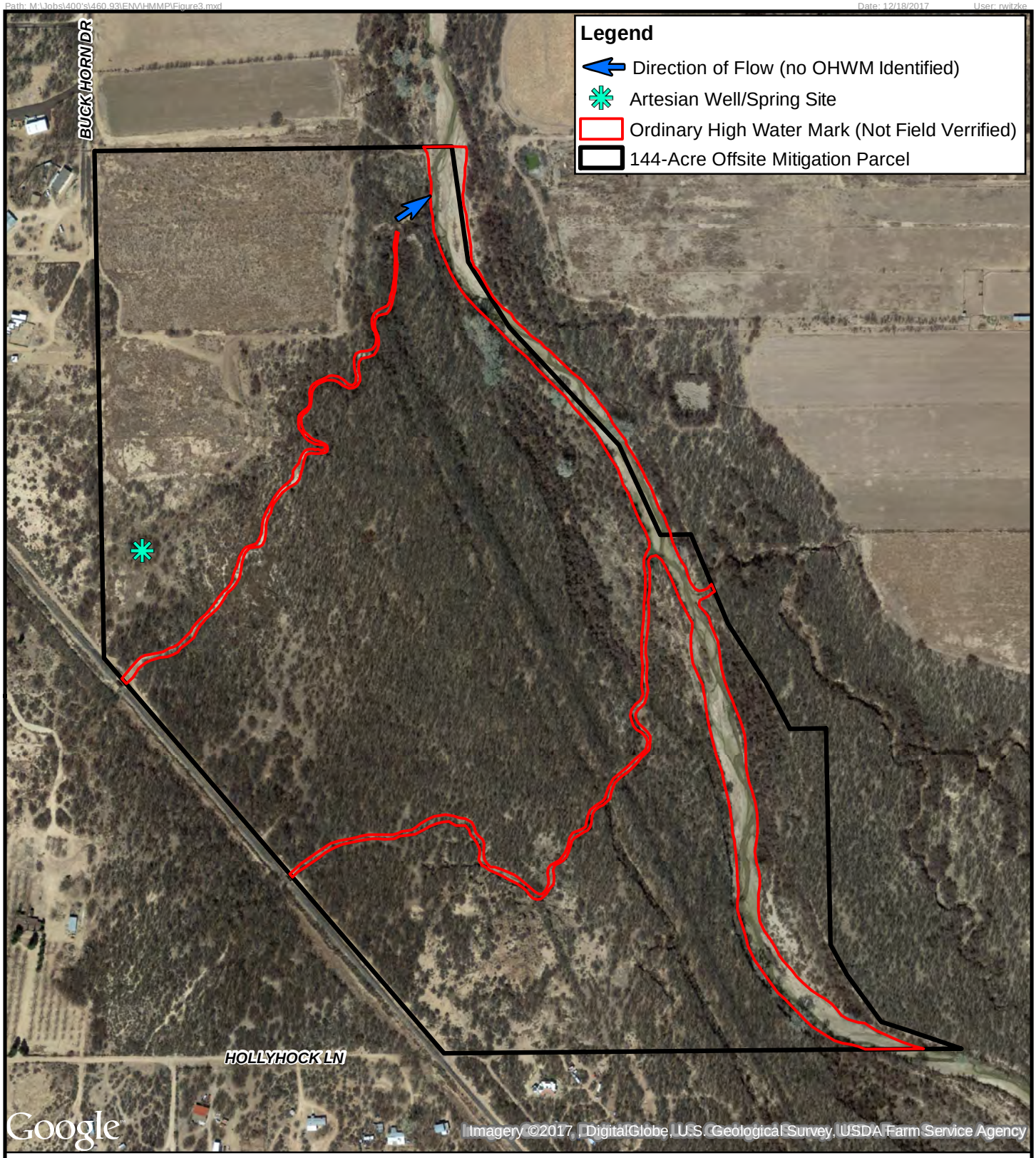
0 60 120 Meters

PHASE 1 OF THE VILLAGES AT VIGNETO

Habitat Mitigation and Monitoring Plan
(ACOE File No. 2003-00826-SDM)

AERIAL OVERVIEW OF
THE OFFSITE ANALYSIS AREA

Figure 2



T17S, R20E, Portions of Sections 23 and 24
Cochise County, Arizona,
Data Source: RBF and Rick Engineering
Image Source: Google Earth 2/20/2016

PHASE 1 OF THE VILLAGES AT VIGNETO

Habitat Mitigation and Monitoring Plan
(ACOE File No. 2003-00826-SDM)

OFFSITE MITIGATION PARCEL
OHWM DELINEATION

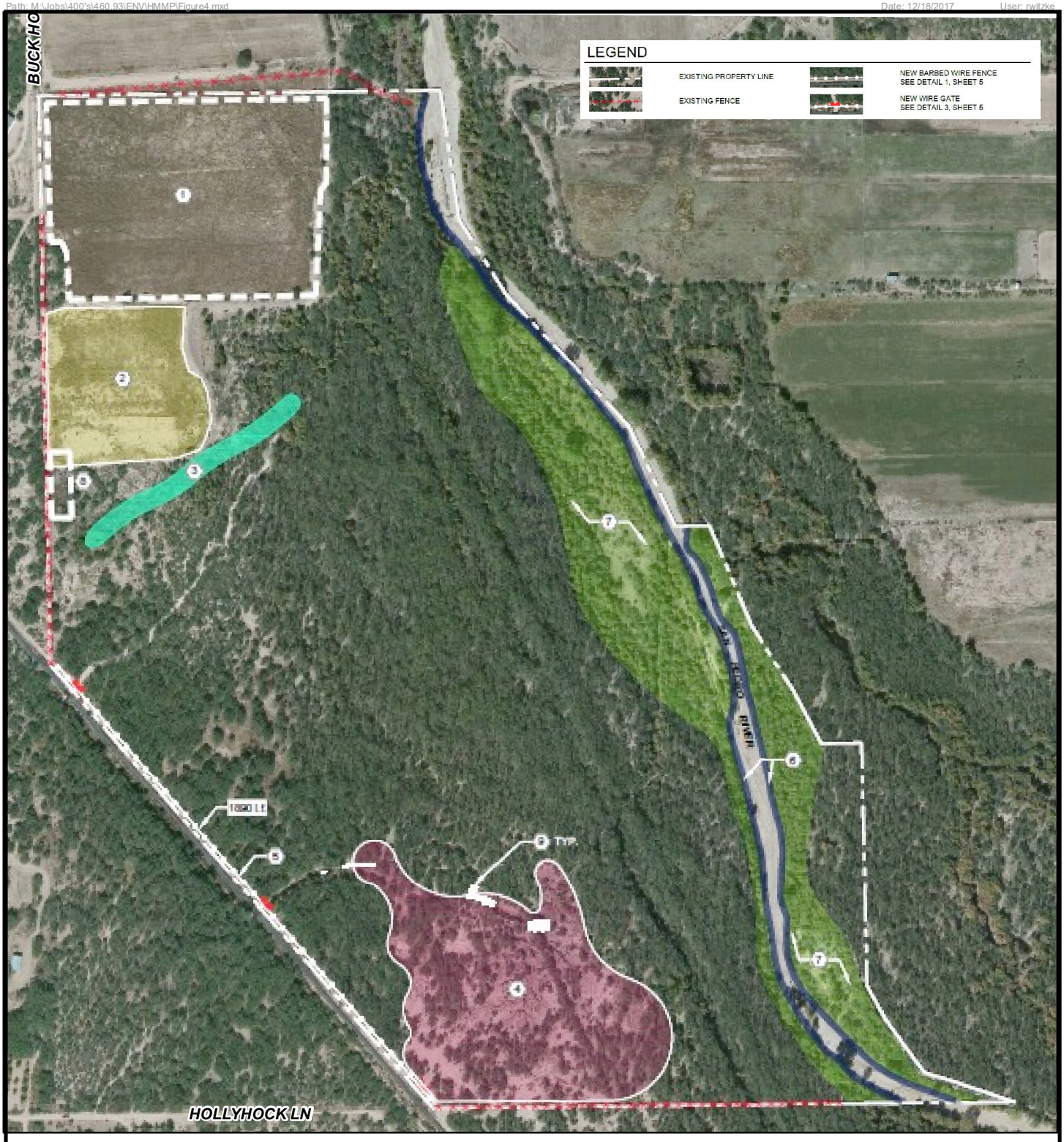
Figure 3

WestLand Resources

N

0 250 500 Feet

0 75 150 Meters



T17S, R20E, Portions of Sections 23 and 24
Cochise County, Arizona,
Image Source: 2015 USDA NAIP Orthophoto
Data Source: RBF and Rick Engineering
Image Source: Implemetation Plan (apendix B.)

PHASE 1 OF THE VILLAGES AT VIGNETO

Habitat Mitigation and Monitoring Plan
(ACOE File No. 2003-00826-SDM)

IMPLEMENTATION PLANS OFFSITE MITIGATION PARCEL PLANTING AND FENCING PLAN
Figure 4

WestLand Resources

N

0 250 500 Feet

0 75 150 Meters

APPENDIX A

RESTRICTIVE COVENANTS

RECORDING REQUESTED BY AND
WHEN RECORDED RETURN TO:

El Dorado Benson LLC
Attn: M. Reinbold
8501 N. Scottsdale Road. Suite 120
Scottsdale, AZ 85253

(Space Above Line for Recorder's Use)

DECLARATION OF RESTRICTIVE COVENANTS

This DECLARATION OF RESTRICTIVE COVENANTS ("**Restrictive Covenant**") is made this ____ day of _____, 20__ by El Dorado Benson, L.L.C., an Arizona limited liability company (hereinafter "**Declarant**").

R E C I T A L S

A. Declarant is the sole owner in fee simple of certain real property containing approximately 142.5 acres, located in the County of Cochise, State of Arizona, found on Assessor's Parcel Number 124-18-008D and desires to grant a restrictive covenant over the property (the "**Restricted Property**"). The Restricted Property is legally described and depicted on **Exhibit "A"** attached hereto and incorporated by this reference. The Restricted Property is located outside of the municipal boundary but within the planning boundary of the City of Benson.

B. The Restricted Property provides, among other things, compensatory mitigation for certain impacts from development of the Villages at Vigneto ("**Project**") by Declarant pursuant to requirements of (1) the United States Army Corps of Engineers' ("**ACOE**") Clean Water Act (CWA) Section 404 Permit No. 2003-00826-SDM and any amendments thereto (**"Section 404 Permit**").

C. This Restrictive Covenant is designed to satisfy and is granted in satisfaction of the Section 404 Permit.

D. Consistent with the terms and conditions of this Restrictive Covenant, the Restricted Property is and will remain in a Natural Condition as defined herein and is intended to be preserved in its natural, scenic, open condition to maintain its ecological, historical, visual and educational values (collectively, "**Conservation Values**"). The Conservation Values are of importance to the people of the County of Cochise and the people of the United States. The Restricted Property has been designated as an "Environmentally Sensitive Area" by the City of

Benson General Development Plan, the most recent version of which was adopted by the Benson City Council on February 23, 2015 by Resolution 8-2015.

E. The ACOE is the federal agency charged with the primary responsibility for regulating activities in waters of the United States, including wetlands, with regulatory authority over discharges of dredged and fill material into such waters pursuant to Section 404 of the Clean Water Act, and is a third party beneficiary of this Restrictive Covenant.

F. Following recordation and subject to Section 11 below, Declarant intends to convey all of the Restricted Property to a conservation organization or a property owners' association. Should Declarant transfer its interest in the Restricted Property prior to the time that Compensatory Mitigation (defined below) is fulfilled, the conservation organization or property owners' association will assume the roles and responsibilities of Declarant, including long-term maintenance, under this Restrictive Covenant, except that Declarant, as the developer of the Project, will remain responsible for the Compensatory Mitigation until it has been successfully implemented and completed per the success criteria set forth in the Mitigation Plan.

COVENANTS, TERMS, CONDITIONS AND RESTRICTIONS

In consideration of the above recitals and the covenants, terms, conditions, and restrictions contained herein, and pursuant to the laws of the United States and State of Arizona, including Arizona Revised Statutes 33-271, *et seq.*, Declarant hereby declares the Restricted Property shall be held, transferred, conveyed, leased, occupied or otherwise disposed of, and used subject to the following restrictive covenants (and incorporating the above recitals herein by this reference), which shall run with the land, and be binding on Declarant's heirs, successors in interest, administrators, assigns, lessees, or other occupiers and users of the Restricted Property, or any portion of it.

1. Purpose.

(a) The purposes of this Restrictive Covenant are to (1) ensure the Restricted Property will be preserved in a Natural Condition, as defined herein, in perpetuity and (2) prevent any use of the Restricted Property that will impair or interfere with the Conservation Values of the Restricted Property (the "**Purpose**"). Declarant intends that this Restrictive Covenant will confine the use of the Restricted Property to such activities that are consistent with this Purpose, including without limitation, those involving the preservation, restoration, and enhancement of native species and their habitats.

(b) The term "**Natural Condition**," as referenced in the preceding paragraph and other portions of this Restrictive Covenant, shall mean the condition of the Restricted Property as it exists at the time this Restrictive Covenant is executed, as well as future enhancements or changes to the Restricted Property that occur directly as a result of the following activities:

(1) Compensatory mitigation measures (**"Compensatory Mitigation**"), including implementation, maintenance and monitoring activities, required by the Section 404 Permit and as described in the "Habitat Mitigation and Monitoring Plan, ACOE File No. 2003-00826-SDM, Whetstone Ranch," prepared by WestLand Resources, Inc, dated November 2005, including any modification thereto approved by the ACOE (the "**Mitigation Plan**"). The cover page is attached as **Exhibit "B"**;

(2) In-perpetuity maintenance obligations ("**Long-Term Maintenance**") that occur on the Restricted Property as described in Section 14 herein.

(3) Activities described in Section 3 and Section 5 herein.

(c) Declarant represents and warrants that there are no structures or other man-made improvements existing on the Restricted Property [**OR,** the only structures or other man-made improvements existing on the Restricted Property consist of (describe)]. Declarant further represents and warrants there are no previously granted easements existing on the Restricted Property that interfere or conflict with the Purpose of this Restrictive Covenant as evidenced by the Preliminary Title Report dated November 2, 2015, attached hereto as **Exhibit "C**." The present Natural Condition is evidenced in part by the depiction of the Restricted Property attached on **Exhibit "D,"** showing all relevant and plottable property lines, easements, dedications, improvements, structures, boundaries, and major, distinct natural features such as waters of the United States. Declarant has delivered further evidence of the present Natural Condition to ACOE consisting of (1) a color aerial photograph of the Restricted Property at an appropriate scale taken _____; (2) an overlay of the Restricted Property boundaries on that aerial photograph; and (3) on-site color photographs showing all improvements, structures, and natural features of the Restricted Property.

(d) If a controversy arises with respect to the present Natural Condition of the Restricted Property, Declarant and/or ACOE shall not be foreclosed from utilizing any and all other relevant documents, surveys, photographs or other evidence or information to assist in the resolution of the controversy.

(e) The term "**Biological Monitor**" shall mean either an employee of the Declarant or an independent third-party consultant with knowledge of riparian resources in the Cochise County area and expertise in the field of biology or a related field.

2. ACOE's rights. To accomplish the Purpose of this Restrictive Covenant, Declarant hereby grants and conveys the following rights to ACOE (but without obligation of the ACOE):

(a) A non-exclusive easement on and over the Restricted Property to preserve and protect the Conservation Values of the Restricted Property; and

(b) A non-exclusive easement on and over the Restricted Property to enter upon the Restricted Property to monitor Declarant's compliance with and to otherwise enforce the terms of this Restrictive Covenant; and

(c) A non-exclusive easement on and over the Restricted Property to prevent any activity on or use of the Restricted Property that is inconsistent with the Purpose of this Restrictive Covenant and to require the restoration of such areas or features of the Restricted Property that may be damaged by any act, failure to act, or any use that is inconsistent with the Purpose of this Restrictive Covenant; and

(d) All present and future development rights allocated, implied, reserved or inherent in the Restricted Property; such rights are hereby terminated and extinguished, and may not be used on or transferred to any portion of the Restricted Property, nor any other property adjacent or otherwise; and

(e) The right to enforce by any means, including, without limitation, injunctive relief, the terms and conditions of this Restrictive Covenant.

3. Declarant's Duties. El Dorado Benson, L.L.C., or any successor permittee under the Section 404 Permit which assumes mitigation obligations under the Section 404 Permit, shall undertake construction, maintenance and monitoring of mitigated areas pursuant to the Mitigation Plan until receipt of final approval of the success of the Mitigation Plan from ACOE ("**Final Approval**"). This duty is non-transferrable, except to a successor permittee under the Section 404 Permit. Declarant, its successors and assigns shall:

(a) Undertake all reasonable actions to prevent the unlawful entry and trespass by persons whose activities would be inconsistent with the Conservation Values and would violate the permitted uses of the Restricted Property set forth in this Restrictive Covenant; and

(b) Cooperate with ACOE in the protection of the Conservation Values; and

(c) Repair and restore damage to the Restrictive Property directly or indirectly caused by Declarant, Declarant's guests, representatives or agents and third parties within Declarant's control; provided, however, Declarant, its successors or assigns shall not engage in any repair or restoration work in the Restricted Property without first consulting with ACOE; and

(d) Obtain any applicable governmental permits and approvals for any activity or use permitted by this Restrictive Covenant, and any activity or use shall be undertaken in accordance with all applicable federal, state, local and administrative agency statutes, ordinances, rules, regulations, orders or requirements; and

(e) Upon receipt of Final Approval, perform in-perpetuity Long-Term Maintenance on the Restricted Property set forth in Section 14 below; and

(f) Within 60 days of recordation of this Restrictive Covenant, install signs and other notification features saying "Natural Area Open Space," "Protected Natural Area," or similar descriptions that inform persons of the nature and restrictions on the Restricted Property. Prior to erection of such signage, Declarant shall submit detailed plans showing the location and language of such signs to ACOE for review and approval. The erection and maintenance of informative signage shall not be in direct or potential conflict with the preservation of the Natural Condition of the Restricted Property or the Purpose of this Restrictive Covenant and shall be performed in compliance with all applicable statutes, regulations, and permitting requirements; and

(g) Perform an annual compliance inspection of the Restricted Property, prepare an inspection report, and shall make reports available to ACOE upon request.

4. Prohibited Uses. Any activity on or use of the Restricted Property inconsistent with the Purpose of this Restrictive Covenant is prohibited. Without limiting the generality of the foregoing, the following uses by Declarant, and its respective guests, agents, assigns, employees, representatives, successors and third parties within Declarant's control, are expressly prohibited:

(a) Supplemental or unseasonable watering except as specifically provided for in the Mitigation Plan;

(b) Use of herbicides, pesticides, rodenticides, biocides, fertilizers, or other agricultural chemicals or weed abatement activities, except weed abatement activities necessary to control or remove invasive, exotic plant species;

(c) Incompatible fire protection activities, except the fire prevention activities set forth in Subsection 5(f);

(d) Use of off-road vehicles and use of any other motorized vehicles except on existing roadways and as necessary to restore native plant communities consistent with Section 5;

(e) Grazing or other agricultural activity of any kind;

(f) Recreational activities, including, but not limited to, horseback riding, biking, hunting or fishing;

(g) Residential, commercial, retail, institutional, or industrial uses;

(h) Any legal or de facto division, subdivision or partitioning of the Restricted Property;

(i) Construction, reconstruction or placement of any building, road, wireless communication cell towers, or other improvement, or any billboard, fence, boundary marker or sign, except fences required to comply with Subsection 3(a) and signs permitted in Subsection 3(f);

(j) Depositing, dumping or accumulating soil, trash, ashes, refuse, waste, bio-solids or any other material;

(k) Planting, introduction or dispersal of non-native or exotic plant or animal species;

(l) Filling, dumping, excavating, draining, dredging, mining, drilling, removing or exploring for or extraction of minerals, loam, gravel, soil, rock, sand or other material on or below the surface of the Restricted Property;

(m) Altering the general topography of the Restricted Property, including but not limited to building of roads and trails, and flood control work, except as provided for in the Mitigation Plan;

(n) Removing, destroying, or cutting of trees, shrubs or other vegetation, except as necessary for (1) emergency fire protection as required by fire safety officials as set forth in Subsection 5(f), (2) controlling invasive, exotic plants which threaten the integrity of the habitat, (3) preventing or treating disease, (4) conducting activities permitted by the Mitigation Plan, or (5) activities described in Section 3, Section 5 and Section 14. In the event that activity in the Restricted Property is necessary to prevent or treat disease as listed in item (3) herein, the first priority for action shall be chemical and biological methods. No invasive or non-native species shall be introduced to prevent or treat disease, unless chemical or biological methods have failed to resolve the problem and a Federal, State or local agency with authority determines that no other methods will address the problem. Removal of vegetation to prevent or treat disease shall only be allowed if chemical or biological methods have failed to resolve the problem or upon a showing that removal of vegetation is required on an emergency basis;

(o) Manipulating or altering any natural watercourse, body of water or water circulation on the Restricted Property other than as described in the Mitigation Plan, and activities or uses detrimental to water quality, including but not limited to degradation or pollution of any surface or sub-surface waters;

(p) Creating, enhancing, or maintaining fuel modification zones (defined as a strip of mowed land or the planting of vegetation possessing low combustibility for purposes of fire suppression), or other activities that could constitute fuel modification zones;

(q) Without the prior written consent of ACOE, which ACOE may withhold, transferring, encumbering, selling, leasing, or otherwise separating the mineral, air or water rights from the Restricted Property; changing the place or purpose of use of the water rights on the Restricted Property; abandoning or allowing the abandonment of, by action or inaction, any water or water rights, ditch or ditch rights, spring rights, reservoir or storage rights, wells, ground water rights, or other rights in and to the use of water historically used on or otherwise appurtenant to the Restricted Property, including but not limited to: (1) riparian water rights; (2) appropriative water rights; (3) rights to waters which are secured under contract with any irrigation or water district, to the extent such waters are customarily applied to the Restricted Property; and (4) any

water from wells that are in existence or may be constructed in the future on the Restricted Property;

(r) Engaging in any use or activity that may violate, or may fail to comply with, relevant federal, state, or local laws, regulations, or policies applicable to Declarant, the Restricted Property, or the use or activity in question;

(s) No use shall be made of the Restricted Property, and no activity thereon shall be permitted, that is or is likely to become inconsistent with the Purpose of this Restrictive Covenant. Declarant acknowledges that, in view of the perpetual nature of this Restrictive Covenant, it is unable to foresee all potential future land uses, future technologies, and future evolution of the land and other natural resources, and other future occurrences affecting the Purpose of this Restrictive Covenant. ACOE may determine whether (1) proposed uses or proposed improvements not contemplated by or addressed in this Restrictive Covenant or (2) alterations in existing uses or structures, are consistent with the Purpose of this Restrictive Covenant; and

(t) Creation of any encumbrance superior to this Restrictive Covenant, other than those encumbrances set forth in **Exhibit "C"** hereto, or the recording of any involuntary lien (which is not released within thirty calendar days), or the granting of any lease, license or similar possessory interest in the Restricted Property which will affect the Conservation Values of the Restricted Property.

5. Reserved Rights. Declarant reserves to itself, and to its personal representatives, heirs, successors, and assigns, all rights accruing from its ownership of the Restricted Property, including the right to engage in or to permit or invite others to engage in all uses of the Restricted Property that are not expressly prohibited or limited by, and are consistent with, the Purpose of this Restrictive Covenant, including, but not limited to, the following uses:

(a) Access. Reasonable access through the Restricted Property to adjacent land or to perform obligations or other activities permitted by this Restrictive Covenant or that are required under the Section 404 Permit or Mitigation Plan. In addition, police and other public safety organizations and their personnel may enter the Restricted Property to address any legitimate public health or safety matter. When and if El Dorado Benson, L.L.C. assigns its rights and duties under this Restrictive Covenant to a conservation organization or property owners' association, El Dorado Benson, L.L.C. may not assign to the conservation organization or property owners' association the duty to undertake construction, maintenance and monitoring of mitigated areas pursuant to the Mitigation Plan, i.e., El Dorado Benson, L.L.C. will remain responsible for the Compensatory Mitigation obligations of the Section 404 Permit until Final Approval is obtained. In the event El Dorado Benson, L.L.C. conveys its interest in the Restricted Property prior to completion of Compensatory Mitigation requirements, El Dorado Benson, L.L.C. expressly reserves the right for it or its agents to enter the Restricted Property to perform such work thereon as is required to meet the Compensatory Mitigation obligations of the Section 404 Permit.

(b) Habitat Enhancement Activities. Enhancement of native plant communities, including the right to plant trees and shrubs of the same type as currently exist on the Restricted Property, so long as such activities do not harm the habitat types identified in the Section 404 Permit or Mitigation Plan. For purposes of preventing erosion and reestablishing native vegetation, the Declarant shall have the right to revegetate areas that may be damaged by the permitted activities under this Section 5, naturally occurring events or by the acts of persons wrongfully damaging the Natural Condition of the Restricted Property. Prior to any habitat enhancement activities, Declarant shall have a Biological Monitor submit detailed plans to ACOE for review and approval. Habitat enhancement activities shall not be in direct or potential conflict with the preservation of the Natural Condition of the Restricted Property or the Purpose of this Restrictive Covenant and shall be performed in compliance with all applicable laws, regulations, and permitting requirements.

(c) Vegetation, Debris, and Exotic Species Removal. Removal or trimming of vegetation downed or damaged due to natural disaster, removal of man-made debris, removal of parasitic vegetation (as it relates to the health of the host plant) and removal of non-native or exotic plant or animal species. Vegetation, debris, and exotic plant species removal shall not be in direct or potential conflict with the preservation of the Natural Condition of the Restricted Property or the Purpose of this Restrictive Covenant and shall be performed in compliance with all applicable laws, regulations, and permitting requirements.

(d) Erection and Maintenance of Informative Signage. Erection and maintenance of signage and other notification features saying "No Trespass" or similar descriptions that inform persons of the nature and restrictions on the Restricted Property.

(e) [intentionally deleted]

(f) Fire Protection. The right, in an emergency situation only, to maintain firebreaks (defined as a strip of plowed or cleared land made to check the spread of a fire), trim or remove brush, otherwise perform preventative measures required by the fire department to protect structures and other improvements from encroaching fire. All other brush management activities, activities prohibited by Subsection 4(p), or other fire prevention measures suggested by the fire department, shall be limited to areas outside the Restricted Property.

(g) Mitigation Plan. Notwithstanding anything herein to the contrary, El Dorado Benson, L.L.C., or any assignee of the Section 404 Permit which assumes mitigation obligations under such permit, may take any action required by the Mitigation Plan. Such actions may include, but are not limited to the following: (1) the right to maintain, repair and or replace from time to time any or all of the vegetation planted as part of the Mitigation Plan and (2) actions taken consistent with the Mitigation Plan.

6. Enforcement.

(a) Right to Enforce. Declarant, its successors and assigns, grant to ACOE and the U.S. Department of Justice a discretionary right to enforce these restrictive covenants in a judicial or administrative action against any person(s) or other entity(ies) violating or attempting to violate these restrictive covenants; provided, however, that no violation of these restrictive covenants shall result in a forfeiture or reversion of title. The U.S. Department of Justice shall have the same rights, remedies and limitations as ACOE under this Section 6. The rights under this Section are in addition to, and do not limit rights conferred in Section 2 above, the rights of enforcement against Declarant, its successor or assigns under the Section 404 Permit, or any rights of the various documents created thereunder or referred to therein.

(b) Notice.

(1) If ACOE determines Declarant is in violation of the terms of this Restrictive Covenant or that a violation is threatened, ACOE may demand the cure of such violation. In such a case, ACOE shall issue a written notice to Declarant (hereinafter "**Notice of Violation**") informing Declarant of the violation and demanding cure of such violation.

(2) Declarant shall cure the noticed violation within thirty (30) days of receipt of said written notice from ACOE. If said cure reasonably requires more than thirty (30) days, Declarant shall, within the thirty (30) day period submit to ACOE for review and approval a plan and time schedule to diligently complete a cure. Declarant shall complete such cure in accordance with the approved plan. If Declarant disputes the Notice of Violation, it shall issue a written notice of such dispute (hereinafter "**Notice of Dispute**") to the ACOE within thirty (30) days of receipt of written Notice of Violation.

(3) If Declarant fails to cure the noticed violation(s) within the time period(s) described in Subsection 6(b)(2) above, or Subsection 6(c) below, ACOE may bring an action at law or in equity in a court of competent jurisdiction to enforce compliance by Declarant with the terms of this Restrictive Covenant. In such action, the ACOE may (i) recover any damages to which they may be entitled for violation by Declarant of the terms of this Restrictive Covenant, (ii) enjoin the violation, *ex parte* if necessary, by temporary or permanent injunction without the necessity of proving either actual damages or the inadequacy of otherwise available legal remedies, or (iii) pursue other equitable relief, including, but not limited to, the restoration of the Restricted Property to the condition in which it existed prior to any such violation or injury. ACOE may apply any damages recovered to the cost of undertaking any corrective action on the Restricted Property.

(4) If Declarant provides ACOE with a Notice of Dispute, as provided herein, ACOE shall meet and confer with Declarant at a mutually agreeable place and time, not to exceed thirty (30) days from the date that ACOE receives the Notice of Dispute. ACOE shall consider all relevant information concerning the disputed violation provided by Declarant and shall determine whether a violation has in fact occurred and, if so, whether the Notice of Violation and demand for cure issued by ACOE is appropriate in light of the violation.

(5) If, after reviewing Declarant's Notice of Dispute, conferring with Declarant, and considering all relevant information related to the violation, ACOE determines that a violation has occurred, ACOE shall give Declarant notice of such determination in writing. Upon receipt of such determination, Declarant shall have thirty (30) days to cure the violation. If said cure reasonably requires more than thirty (30) days, Declarant shall, within the thirty (30) day period submit to ACOE for review and approval a plan and time schedule to diligently complete a cure. Declarant shall complete such cure in accordance with the approved plan.

(c) Immediate Action. If ACOE determines that circumstances require immediate action to prevent or mitigate significant damage to the Conservation Values of the Restricted Property, ACOE may immediately pursue all available remedies, including injunctive relief, available pursuant to both this Restrictive Covenant and state and federal law after giving Declarant at least twenty four (24) hours' written notice before pursuing such remedies. So long as such twenty four (24) hours' notice is given, ACOE may immediately pursue all available remedies without waiting for the expiration of the time periods provided for cure or Notice of Dispute as described in Subsection 6(b)(2). The written notice pursuant to this paragraph may be transmitted to Declarant by facsimile. The rights of ACOE under this paragraph apply equally to actual or threatened violations of the terms of this Restrictive Covenant. Declarant agrees that the remedies at law for ACOE for any violation of the terms of this Restrictive Covenant are inadequate and that ACOE shall be entitled to the injunctive relief described in this section, both prohibitive and mandatory, in addition to such other relief to which ACOE may be entitled, including specific performance of the terms of this Restrictive Covenant, without the necessity of proving either actual damages or the inadequacy of otherwise available legal remedies. The remedies described in this Subsection 6(c) shall be cumulative and shall be in addition to all remedies now or hereafter existing at law or in equity.

(d) Costs of Enforcement. Any costs incurred by ACOE, as the prevailing party, in enforcing the terms of this Restrictive Covenant against Declarant including, but not limited to, costs of suit and attorneys' fees, and any costs of restoration necessitated by Declarant's negligence or breach of this Restrictive Covenant shall be borne by Declarant.

(e) Enforcement Discretion. Enforcement of the terms of this Restrictive Covenant shall be at the discretion of ACOE. Any forbearance by ACOE to exercise rights under this Restrictive Covenant in the event of any breach of any term of this Restrictive Covenant by Declarant shall not be deemed or construed to be a waiver by ACOE of such term or of any subsequent breach of the same or any other term of this Restrictive Covenant or of any of the rights of ACOE under this Restrictive Covenant. No delay or omission by ACOE in the exercise of any right or remedy upon any breach by Declarant shall impair such right or remedy or be construed as a waiver. Further, nothing in this Restrictive Covenant creates a non-discretionary duty upon ACOE to enforce its provisions, nor shall deviation from the terms and procedures or failures to enforce its provisions give rise to a private right of action against ACOE by any third party.

(f) Acts Beyond Declarant's Control. Nothing contained in this Restrictive Covenant shall be construed to entitle ACOE to bring any action against Declarant for any injury to or change in the Restricted Property resulting from:

(1) Any natural cause beyond Declarant's control, including without limitation, fire not caused by Declarant, flood, storm, and earth movement; or

(2) Any prudent action taken by Declarant under emergency conditions to prevent, abate, or mitigate significant injury to persons and/or the Restricted Property resulting from such causes, provided that once the emergency has abated, Declarant, its successors or assigns promptly take all reasonable and necessary actions required to restore any damage caused by Declarant's actions to the Restricted Property to the condition it was in immediately prior to the emergency; or

(3) Acts of third parties (including any governmental agencies) that are beyond Declarant's control.

Notwithstanding the foregoing, Declarant must obtain any applicable governmental permits and approvals for any emergency activity or use permitted by this Restrictive Covenant and undertake any activity or use in accordance with all applicable federal, state, local and administrative agency statutes, ordinances, rules, regulations, orders or requirements.

7. Access. This Restrictive Covenant does not convey a general right of access to the public.

8. Costs and Liabilities.

(a) Declarant, or its successor or assign retains all responsibilities and shall bear all costs and liabilities of any kind related to the ownership, operation, upkeep and maintenance of the Restricted Property. Declarant agrees ACOE shall not have any duty or responsibility for the operation, upkeep, or maintenance of the Restricted Property, the monitoring of hazardous conditions thereon, or the protection of Declarant, the public or any third parties from risks relating to conditions on the Restricted Property. Declarant, its successor or assign remains solely responsible for obtaining any applicable governmental permits and approvals for any activity or use permitted by this Restrictive Covenant, and any activity or use shall be undertaken in accordance with all applicable federal, state, local and administrative agency statutes ordinances, rules, regulations, orders and requirements.

(b) Declarant, or its successors and assigns shall hold harmless, protect and indemnify ACOE and its respective directors, officers, employees, agents, contractors, and representatives and the heirs, personal representatives, successors and assigns of each of them (each a "**Third-Party Beneficiary Indemnified Party**" and collectively, "**Third-Party Beneficiary Indemnified Parties**") from and against any and all liabilities, penalties, costs, losses, damages, expenses (including, without limitation reasonable attorneys' fees and experts' fees), causes of

action, claims, demands, orders, liens or judgments (each a "**Claim**" and, collectively, "**Claims**"), arising from or in any way connected with injury to or the death of any person, or physical damage to any property, regardless of cause.

9. Taxes; No Liens. If applicable, Declarant, its successor or assign shall pay before delinquency all taxes, assessments, fees, and charges of whatever description levied on or assessed against the Restricted Property by competent authority, including any taxes imposed upon, or incurred as a result of, this Restrictive Covenant, and agrees to furnish ACOE with satisfactory evidence of payment upon request. Declarant shall keep the Restricted Property free from any liens, including those arising out of any obligations incurred by Declarant or any labor or materials furnished or alleged to have been furnished to or for Declarant at or for use on the Restricted Property.

10. Condemnation. The Purpose of this Restricted Covenant for conservation purposes are presumed to be the best and most necessary public use as defined in Arizona Revised Statutes Section 12-1122 except that Declarant reserves the right to seek fair market value for any condemnation action. Nevertheless, if all or any part of the Restricted Property is taken by exercise of the power of eminent domain, Declarant shall use the net proceeds from the condemnation of the Restricted Property for the purchase of property that replaces the natural resource characteristics the original mitigation was intended to protect, or as near as reasonably feasible. The endowment shall be held for the long-term stewardship of the replacement property. The location of the replacement property and replacement restrictive covenant is subject to prior approval by the ACOE.

11. Assignment and Subsequent Transfers.

(a) Declarant agrees to incorporate the terms of this Restrictive Covenant in any deed or other legal instrument by which Declarant divests itself of any interest in all or a portion of the Restricted Property. Declarant, its successor or assign agrees to (i) incorporate by reference to the title of and the recording information for this Restrictive Covenant in any deed or other legal instrument by which each divests itself of any interest in all or a portion of the Restricted Property, including, without limitation, a leasehold interest and (ii) give actual notice to any such transferee or lessee of the existence of this Restrictive Covenant. Declarant, its successor or assign agrees to give written notice to ACOE of the intent to transfer any interest at least sixty (60) days prior to the date of such transfer. Any subsequent transferee shall be deemed to have assumed the obligations of this Restrictive Covenant and to have accepted the restrictions contained herein. The failure of Declarant, its successor or assign to perform any act provided in this Section shall not impair the validity of this Restrictive Covenant or limit its enforceability in any way.

(b) From and after the date of any transfer of all or any portion of the Restricted Property by Declarant and each transfer thereafter, (i) the transferee shall be deemed to have assumed all of the obligations of Declarant as to the portion transferred, as set forth in this Restrictive Covenant, (ii) the transferee shall be deemed to have accepted the restrictions

contained herein as to the portion transferred, (iii) the transferor, as applicable, shall have no further obligations hereunder, except for the obligations set forth above in Section 3 related to Compensatory Mitigation and Subsection 17(f), and (iv) all references to Declarant in this Restrictive Covenant shall thereafter be deemed to refer to such transferee.

12. Notices. Any notice, demand, request, consent, approval, or communication that either party desires or is required to give to the other shall be in writing and be served personally or sent by first class mail, postage prepaid, addressed as follows:

To Declarant: El Dorado Benson LLC
8501 N. Scottsdale Road. Suite 120
Scottsdale, AZ 85253

With a copy to:

To ACOE: District Counsel
U.S. Army Corps of Engineers
915 Wilshire Blvd, Room 1535
Los Angeles, CA 90017-3401

or to such other address as either party shall designate by written notice to the other. Notice shall be deemed effective upon delivery in the case of personal delivery or, in the case of delivery by first class mail, five (5) days after deposit into the United States mail.

The parties agree to accept facsimile signed documents and agree to rely upon such documents as if they bore original signatures. Each party agrees to provide to the other parties, within seventy-two (72) hours after transmission of such a facsimile, the original documents that bear the original signatures.

If the Restrictive Covenant is assigned, the assignment document shall update the Notices provisions.

When the underlying fee for the Restricted Property is conveyed, the successor shall record a document entitled Restrictive Covenant/Change of Notices Provisions.

13. Amendment. Declarant may amend this Restrictive Covenant only after written concurrence by ACOE. Declarant shall record any amendments to this Restrictive Covenant approved by ACOE in the official records of Cochise County, Arizona, and shall provide a copy of the recorded document to ACOE.

14. Long-Term Maintenance. Upon Final Approval, Declarant, its successors and assigns, shall:

(a) be responsible for in-perpetuity, ongoing, long-term maintenance of the Restricted Property. Such long-term maintenance shall include but shall not be limited to the following activities: (1) no less than annually, removal of trash or manmade debris, preferably by hand or the least impactive method reasonably feasible, (2) annual maintenance of signage and other notification features or similar descriptions, as applicable, installed pursuant to Subsection 3(f).

(b) be responsible for annual restoration of the Restricted Property damaged by any activities prohibited by Subsection 4 (a) - (t) herein.

(c) prepare a monitoring and maintenance report documenting activities performed under Subsection 14(a) above, and shall make reports available to ACOE upon request.

(d) retain a qualified Biological Monitor to prepare a Restoration Plan and to oversee/monitor restoration activities when such activities are performed pursuant to Subsection 14(b) above. Declarant shall have its Biological Monitor submit a draft Restoration Plan to ACOE for review and approval prior to its implementation. Upon completion of restoration as specified in the approved Restoration Plan, Declarant shall have its Biological Monitor prepare a detailed monitoring report, and Declarant shall make the report available to ACOE within thirty (30) days of completion of restoration activities. Declarant and the Biological Monitor shall sign the monitoring report. The report shall document the Biological Monitor's name and affiliation, dates Biological Monitor was present on site, activities observed and their location, Biological Monitor's observations regarding the adequacy of restoration performance by the Declarant, or its contractor in accordance with the approved Restoration Plan, and the corrections recommended and implemented.

15. Recordation. Declarant, its successor or assign shall promptly record this instrument in the official records of Cochise County, Arizona, and provide a copy of the recorded document to ACOE.

16. Estoppel Certificate. Upon request, ACOE shall within fifteen (15) days execute and deliver to Declarant, its successor or assign a letter confirming that (a) this Restrictive Covenant is in full force and effect, and has not been altered, amended, or otherwise modified (except as specifically noted in the letter), (b) there are no pending or threatened enforcement actions against Declarant except as disclosed in the letter, (c) to the knowledge of the ACOE, there are no uncured violations under the Restrictive Covenant, and no facts or circumstances exist that, with the passage of time, could constitute a violation under the Restrictive Covenant, except as disclosed in the letter.

17. General Provisions.

(a) Controlling Law. The laws of the United States and the State of Arizona, disregarding any conflicts of law principles of such state, shall govern the interpretation and performance of this Restrictive Covenant.

(b) Liberal Construction. Any general rule of construction to the contrary notwithstanding, this Restrictive Covenant shall be liberally construed in favor of the deed to effect the Purpose of this Restrictive Covenant. If any provision in this instrument is found to be ambiguous, an interpretation consistent with the Purpose of this Restrictive Covenant that would render the provision valid shall be favored over any interpretation that would render it invalid.

(c) Severability. If a court of competent jurisdiction voids or invalidates on its face any provision of this Restrictive Covenant, such action shall not affect the remainder of this Restrictive Covenant. If a court of competent jurisdiction voids or invalidates the application of any provision of this Restrictive Covenant to a person or circumstance, such action shall not affect the application of the provision to other persons or circumstances.

(d) No Forfeiture. Nothing contained herein will result in a forfeiture or reversion of Declarant's title in any respect.

(e) Successors and Assigns. The covenants, terms, conditions, and restrictions of this Restrictive Covenant shall be binding upon, and inure to the benefit of, the parties hereto and their respective personal representatives, heirs, successors, and assigns and shall continue as a servitude running in perpetuity with the Restricted Property. The covenants hereunder also benefit ACOE, as a third party beneficiary of this Restrictive Covenant.

(f) Termination of Rights and Obligations. Except as otherwise expressly set forth in this Restrictive Covenant and provided the transfer was consistent with the terms of this Restrictive Covenant, a party's rights and obligations under this Restrictive Covenant shall terminate upon transfer of the party's interest in the Restrictive Covenant or Restricted Property (respectively), except that liability for acts or omissions occurring prior to transfer shall survive transfer. However, in those provisions where the term "El Dorado Benson, L.L.C." is used in this Restrictive Covenant, and not the term "Declarant," those provisions shall be called **"Specific Obligations"** and shall apply exclusively to El Dorado Benson, L.L.C. and shall not be transferred to the conservation organization or property owners' association upon conveyance of El Dorado Benson, L.L.C.'s interest in the Restrictive Covenant or Restricted Property. If El Dorado Benson, L.L.C. conveys its interest in the Project to a bona fide purchaser, the Specific Obligations are assumed by such bona fide purchaser by virtue of this Restrictive Covenant.

(g) Captions. The captions in this instrument have been inserted solely for convenience of reference and are not a part of this instrument and shall have no effect upon construction or interpretation.

(h) No Hazardous Materials Liability.

(1) Declarant represents and warrants that to Declarant's actual knowledge there has been no release or threatened release of Hazardous Materials (defined below) or underground storage tanks existing, generated, treated, stored, used, released, disposed of, deposited or abandoned in, on, under, or from the Restricted Property, or transported to or from

or affecting the Restricted Property. Without limiting the obligations of Declarant under Subsection 8(b) herein, Declarant hereby releases and agrees to indemnify, protect and hold harmless the Third Party Beneficiary Indemnified Parties (defined in Subsection 8(b)) against any and all Claims (defined in Subsection 8(b)) arising from or connected with any Hazardous Materials present, or otherwise alleged to be present, on the Restricted Property at any time, except that this release and indemnification shall be inapplicable to the Third Party Beneficiary Indemnified Parties with respect to any Hazardous Materials placed, disposed or released by third party beneficiaries, their employees or agents. This release and indemnification includes, without limitation, Claims for (i) injury to or death of any person or physical damage to any property; and (ii) the violation or alleged violation of, or other failure to comply with, any Environmental Laws (defined below).

(2) Despite any contrary provision of this Restrictive Covenant, the parties do not intend this Restrictive Covenant to be, and this Restrictive Covenant shall not be, construed such that it creates in or gives ACOE any of the following:

(i) The obligations or liabilities of an "owner" or "operator," as those terms are defined and used in Environmental Laws (defined below), including, without limitation, the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended (42 U.S.C. Section 9601 et seq.; hereinafter, "**CERCLA**"); or

(ii) The obligations or liabilities of a person described in 42 U.S.C. Section 9607(a)(3) or (4); or

(iii) The obligations of a responsible person under any applicable Environmental Laws; or

(iv) The right to investigate and remediate any Hazardous Materials associated with the Restricted Property; or

(v) Any control over Declarant's ability to investigate, remove, remediate or otherwise clean up any Hazardous Materials associated with the Restricted Property.

(3) The term "**Hazardous Materials**" includes, without limitation, (i) material that is flammable, explosive or radioactive; (ii) petroleum products, including by-products and fractions thereof; and (iii) hazardous materials, hazardous wastes, hazardous or toxic substances, or related materials defined in CERCLA, the Resource Conservation and Recovery Act (42 U.S.C. Section 6901 et seq.); the Hazardous Materials Transportation Act (49 U.S.C. Section 5101 et seq.); Title 49 of Arizona Revised Statutes, and in the regulations adopted and publications promulgated pursuant to them, or any other applicable federal, state or local laws, ordinances, rules, regulations or orders now in effect or enacted after the date of this Restrictive Covenant.

(4) The term "**Environmental Laws**" includes, without limitation, any federal, state, local or administrative agency statute, ordinance, rule, regulation, order or requirement relating to pollution, protection of human health or safety, the environment or Hazardous Materials. Declarant represents, warrants and covenants to ACOE that activities upon and use of the Restricted Property by Declarant, its agents, employees, invitees and contractors will comply with all Environmental Laws.

(i) Additional Interests. Declarant shall not grant any additional easements, rights of way or other interests in the surface or subsurface of the Restricted Property (other than a security interest that is subordinate to this Restrictive Covenant), or grant or otherwise abandon or relinquish any water rights relating to the Restricted Property, without first obtaining the written consent of ACOE. ACOE may withhold such consent if it determines that the proposed interest or transfer is inconsistent with the Purpose of this Restrictive Covenant or will impair or interfere with the Conservation Values of the Restricted Property. This Section shall not prohibit transfer of a fee or leasehold interest in the Restricted Property that is subject to this Restrictive Covenant and complies with Section 11. Declarant, its successors and assigns shall record any additional easements or other interests in the Restricted Property approved by the ACOE in the official records of Cochise County, Arizona, and provide a copy of the recorded document to the ACOE.

(j) ACOE Benefited Party. Except for Subsection 17(e), the terms of this Restrictive Covenant are for the benefit of the ACOE only and are not for the benefit of any other party.

(k) Extinguishment. If circumstances arise in the future that render the Purpose of the Restrictive Covenant impossible to accomplish, the Restrictive Covenant can only be terminated or extinguished, in whole or in part, by judicial proceedings in a court of competent jurisdiction.

(l) Warranty. Declarant represents and warrants that there are no outstanding mortgages, liens, encumbrances or other interests in the Restricted Property (excepting those shown on Exhibit "C") which have not been expressly subordinated to this Restrictive Covenant, and that the Restricted Property is not subject to any other Conservation Easement.

(m) Change of Conditions. If one or more of the Purpose of this Restrictive Covenant may no longer be accomplished, such failure of purpose shall not be deemed sufficient cause to terminate the entire Restrictive Covenant as long as any other purpose of the Restrictive Covenant may be accomplished. In addition, the inability to carry on any or all of the permitted uses, or the unprofitability of doing so, shall not impair the validity of this Restrictive Covenant or be considered grounds for its termination or extinguishment. Declarant agrees that global warming and climate change-caused effects shall not be a basis for termination of this Restrictive Covenant.

(n) [deleted]

* * * Signatures on following page. * * *

IN WITNESS WHEREOF Declarant has executed this Restrictive Covenant the day and year first above written and agrees to be bound by the terms and provisions hereof.

"**Declarant**"

EL DORADO BENSON, L.L.C.,
an Arizona limited liability company
By: El Dorado Holdings, Inc.,
an Arizona corporation
Its: Administrative Agent

By:_____
Name:_____
Title:_____

[ATTACH NOTARY ACKNOWLEDGEMENT]

EXHIBIT A

Legal Description

EXHIBIT B

The Mitigation Plan

EXHIBIT C

EXHIBIT D

APPENDIX B

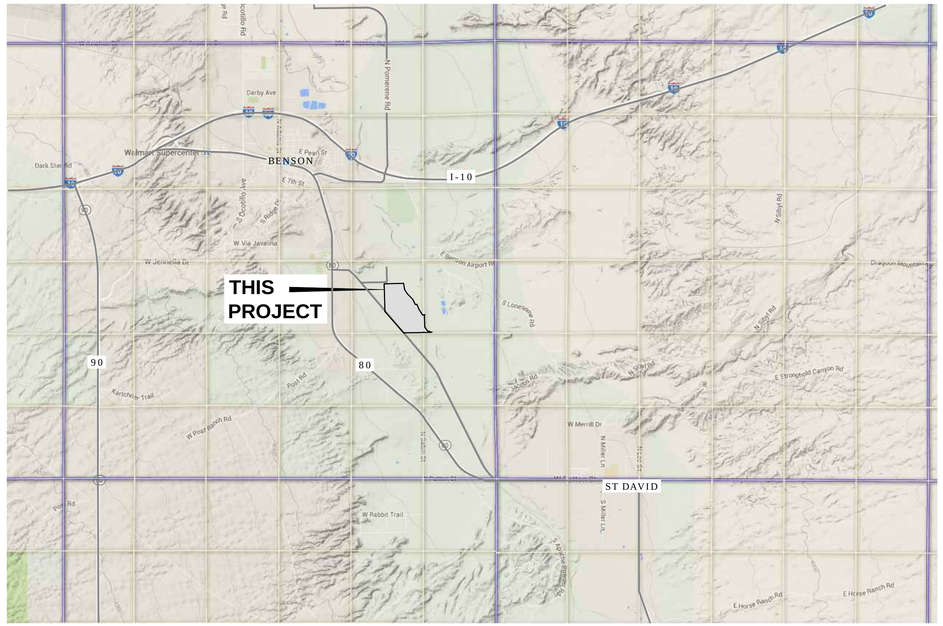
IMPLEMENTATION PLAN

Implementation Plan

Habitat Mitigation & Monitoring Plan - Offsite Mitigation Parcel

200' 0' 200'
SCALE: 1" = 200'

north



LOCATION MAP

1"= Mile

A PORTION OF SECTIONS 23 & 24
T17S – R20E, G.&S.R.M.
COCHISE COUNTY, ARIZONA.

BACKGROUND

This Implementation Plan addresses requirements for the "Offsite Mitigation Parcel" described in the Habitat Mitigation and Monitoring Plan ("the HMMP"; WestLand, November 2005) for the United States Army Corps of Engineers' ("Corps") Clean Water Act ("CWA") Section 404 Permit - Corps File No. 2003-00826-SDM. This CWA Section 404 permit authorized the discharge of dredged and/or fill material into waters of the United States for 8,200 acres within the Villages at Vigneto, formerly Whetstone Ranch. The required work will be performed on a property of approximately 144 acres, of which approximately 22 acres consists of abandoned agricultural land, 115.3 acres is riparian woodland, and 6.7 acres is jurisdictional waters associated with the San Pedro River.

WORK DESCRIBED IN THESE PLANS INCLUDES:

1. INSTALLATION OF NEW BARBED WIRE FENCING.
2. IMPROVEMENTS TO EXISTING NATURAL DRAINAGES IN ORDER TO ARREST ONGOING EROSIONAL HEADCUTTING.
3. RESTORATION OF ABANDONED AGRICULTURAL FIELDS.
4. RESTORATION OF AN EXISTING WETLAND ASSOCIATED WITH AN EXISTING FRESHWATER SPRING.
5. RESTORATION ADJACENT TO THE ACTIVE CHANNEL OF THE SAN PEDRO RIVER.
6. MAINTENANCE OF NEW FENCING & RESTORED AREAS.

THE CONTRACTOR IS ALERTED TO THE APPROVED CWA 404 PERMIT ISSUED BY THE CORPS FOR THIS PROJECT. THIS PERMIT IS CONSIDERED A PART OF THESE CONSTRUCTION DOCUMENTS. THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE REQUIREMENTS STATED THEREIN.

SHEET INDEX

SHEET 1	COVER SHEET
SHEET 2	PLANTING & FENCING PLANS
SHEET 3	ARTESIAN SPRING RECLAMATION AREA
SHEET 4	SOUTHWEST CORNER RECLAMATION AREA
SHEET 5	FENCE & PLANTING DETAILS
SHEET 6	EROSION CONTROL PLAN
SHEET 7	EROSION CONTROL DETAILS
SHEET 8	SPECIFICATIONS

WestLand Resources, Inc.
Engineering and Environmental Consultants
4001 E. Paradise Falls Drive
Tucson, Az 85712 (520) 206-9585

Two working days before you dig
CALL FOR THE BLUESTAKES
1-800-782-5348
1-800-STAKE IT
Blue Stake Center
CALL COLLECT

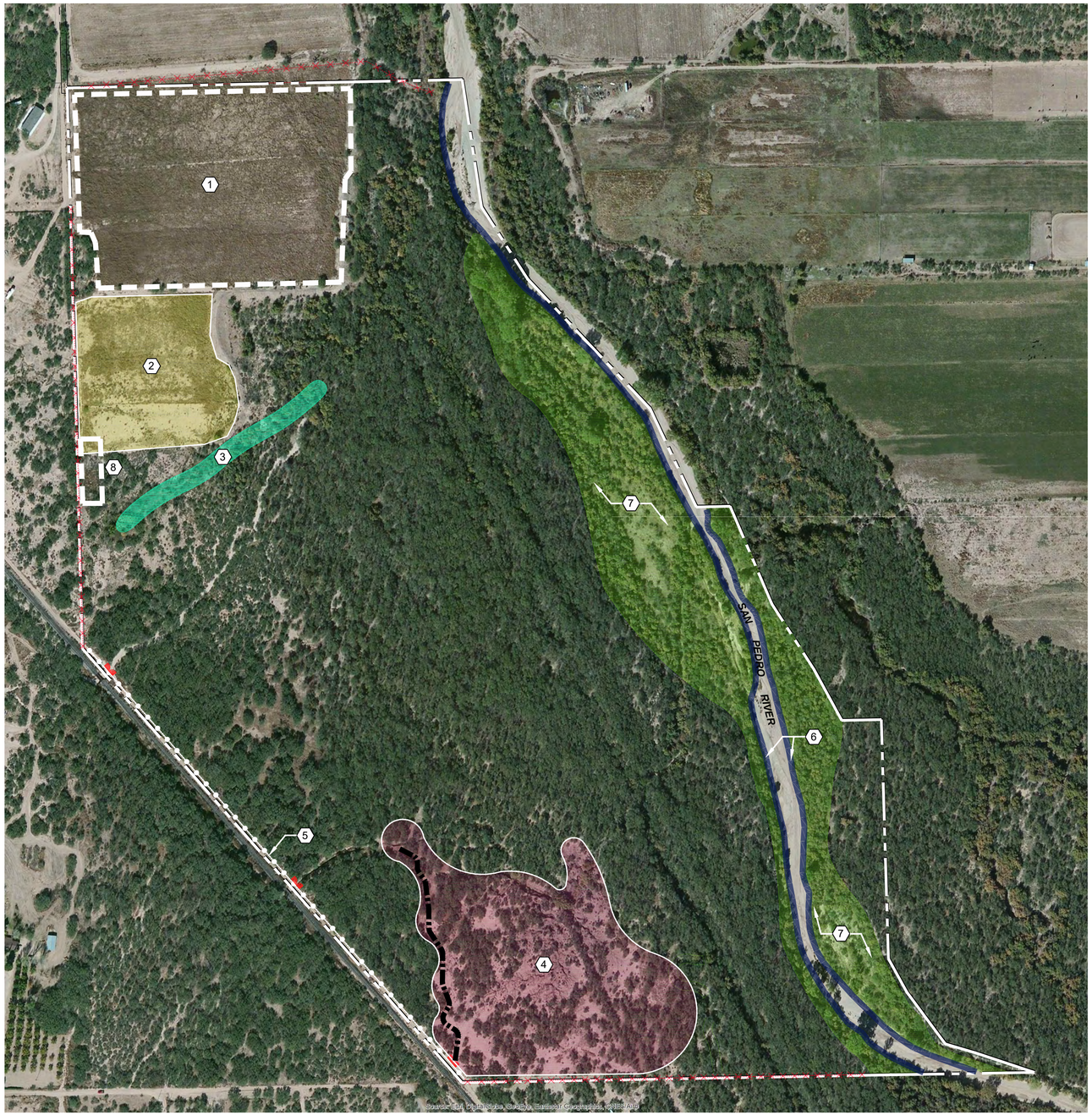
DATE	REVISION	NO.

REGISTERED LANDSCAPE ARCHITECT
37108
JOHN S. ANDERSON
11/17/15
Date Signed
ARIZONA, U.S.A.
Expires 12-31-2016

Villages at Vigneto
(formerly Whetstone Ranch)
CORPS FILE NO. SPL 2003-00826-SDM
IMPLEMENTATION PLANS FOR THE HMMP
OFFSITE MITIGATION PARCEL
COVER SHEET

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SHEET
JSA, RWS,KAS	JSA,KAS	JSA,RWS	1
DATE: 11/17/15	PROJECT NO. 460.76	SCALE:	OF 8

WESTLAND RESOURCES DRAWING PATH
M:\Jobs\400's\460.76\LA\DWG\460.76-Cover.dwg
Nov 17, 2015 - 4:00pm



200' 0' 200'
SCALE: 1" = 200'

north

LEGEND

- EXISTING PROPERTY LINE
- EXISTING FENCE
- NEW BARBED WIRE FENCE SEE DETAIL 1, SHEET 5
- NEW WIRE GATE SEE DETAIL 3, SHEET 5

KEY NOTES

1. CLEAR FALLOW AGRICULTURAL FIELD (APPROXIMATELY 13.2 ACRES): HERBACEOUS WEEDS TO BE REMOVED USING BOTH HAND TOOLS AND MACHINERY AS APPROVED BY OWNER'S REPRESENTATIVE. WEEDS TO BE LEGALLY DISPOSED OF. EXISTING MESQUITES TO REMAIN UNDISTURBED.

2. RECLAIM FALLOW AGRICULTURAL FIELD (APPROXIMATELY 5.3 ACRES):
   - 2.1. PRIOR TO START OF WORK, CONTRACTOR TO REVIEW WITH OWNER'S REPRESENTATIVE SCHEDULE OF ACTIVITIES WITHIN THIS AREA. INTENT IS TO MINIMIZE CONFLICTS BETWEEN PLANTINGS OF CONTAINER STOCK & SEEDING WORK.
   - 2.2. EXISTING MESQUITES TO REMAIN UNDISTURBED.
   - 2.3. HERBACEOUS WEEDS TO BE REMOVED USING BOTH HAND TOOLS AND MACHINERY AS APPROVED BY OWNER'S REPRESENTATIVE. WEEDS TO BE LEGALLY DISPOSED OF.
   - 2.4. FLAG REPRESENTATIVE SECTION OF FIELD FOR CONTAINER-GROWN PLANT LOCATIONS FOR REVIEW & APPROVAL BY OWNER'S REPRESENTATIVE. FLAGS TO IDENTIFY SPECIES OF PLANT.
   - 2.5. INSTALL CONTAINER-GROWN PLANTS ON SITE. PLANTS TO BE SUPPLIED BY OWNER. CONTRACTOR RESPONSIBLE FOR INSTALLATION SCHEDULE & SHIPMENT OF PLANTS TO SITE. SEE SPECIES LIST A THIS SHEET FOR PLANT SPECIES, CONTAINER SIZES & IRRIGATION SCHEDULE THIS AREA.
   - 2.6. MAINTAIN PLANTS PER SPECIFICATIONS.
   - 2.7. RIP OR TILL RECLAMATION AREA TO A DEPTH OF 6". AVOID DISTURBING NEW & EXISTING NATIVE VEGETATION AS IDENTIFIED BY OWNER'S REPRESENTATIVE. TILL PARALLEL TO THE CONTOUR. LEAVE GRADES IN ROUGHENED CONDITION.
   - 2.8. SEED TILLED AREAS WITH NATIVE SEED MIX. REFER TO SPECIFICATIONS.
   - 2.9. CONTRACTOR TO REVIEW USE OF EQUIPMENT OVER SEEDED AREAS WITH OWNER'S REPRESENTATIVE PRIOR TO START OF MAINTENANCE PERIOD. CONTRACTOR TO MINIMIZE DISTURBANCE TO SEEDED AREAS.

3. ARTESIAN SPRING RECLAMATION AREA. SEE SHEET 3.

4. SOUTHWEST CORNER RECLAMATION AREA. SEE SHEET 4.

5. INSTALL APPROXIMATELY 2,000 LINEAR FEET OF NEW BARBED WIRE FENCE:
   - 5.1. SEE DETAIL 1, SHEET 5.
   - 5.2. LAYOUT OF FENCE TO BE STAKED BY OWNER'S REPRESENTATIVE.
   - 5.3. FOR BID PURPOSES, CONTRACTOR TO ASSUME THAT A 4' WIDE CORRIDOR OF EXISTING VEGETATION TO BE CLEARED FOR INSTALLATION OF NEW FENCE.
   - 5.4. CONTRACTOR TO CONFIRM LIMITS OF CLEARING OF EXISTING VEGETATION PRIOR TO CONSTRUCTION.

6. INSTALL COTTONWOODS:
   - 6.1. MEET WITH OWNER'S REPRESENTATIVE ON SITE TO REVIEW TREE LOCATIONS.
   - 6.2. INSTALL TREES ON SITE. TREES TO BE SUPPLIED BY OWNER. CONTRACTOR RESPONSIBLE FOR INSTALLATION SCHEDULE & SHIPMENT OF TREES TO SITE. TOTAL NUMBER OF TREES TO BE INSTALLED THIS LOCATION = 400 NURSERY-GROWN 5-GALLON. SPECIES TO BE INSTALLED IN THIS AREA = COTTONWOOD (POPULUS FREMONTII). INSTALL AT APPROXIMATELY 15' O.C.
   - 6.3. SEE DETAIL 6, SHEET 5.

7. INSTALL MIX OF NATIVE TREES IN THESE AREAS:
   - 7.1. MEET WITH OWNER'S REPRESENTATIVE ON SITE TO REVIEW TREE LOCATIONS. T REES TO BE INSTALLED AMONG EXISTING RIPARIAN VEGETATION.
   - 7.2. INSTALL TREES ON SITE. TREES TO BE SUPPLIED BY OWNER. CONTRACTOR RESPONSIBLE FOR INSTALLATION SCHEDULE & SHIPMENT OF TREES TO SITE. TOTAL NUMBER OF TREES TO BE INSTALLED THIS LOCATION = 1,000 1-GALLON NURSERY-GROWN TREES. SPECIES TO BE INSTALLED IN THIS AREA = MIX OF NATIVE MESQUITE (PROSOPIS JULIFLORA) & NETLEAF HACKBERRY (CELTIS LAEVIGATA VAR. RETICULATA).
   - 7.3. NEW TREES TO BE IRRIGATED USING DRIWATER GELS. SEE DETAIL 5, SHEET 5.

8. REMOVE EXISTING CONSTRUCTED FEATURES:
   - 8.1. MEET WITH OWNER'S REPRESENTATIVE ON SITE TO REVIEW EXISTING CONDITIONS.
   - 8.2. REMOVE CONCRETE SLAB, CONCRETE TROUGH, CORAL & OTHER CONSTRUCTED FEATURES. DISPOSE OF LEGALLY OFFSITE.
   - 8.3. TILL & SEED DISTURBED AREA. SEE SPECIFICATIONS.
   - 8.4. AVOID DISTURBING EXISTING NATIVE VEGETATION AS IDENTIFIED BY OWNER'S REPRESENTATIVE.

SPECIES LIST A

BOTANICAL NAME	COMMON NAME	SIZE	NOTE	QUANTITY THIS AREA
Sporobolus airoides	Alkali Sacaton	1 Gallon	See Detail 5, Sheet 5	575
Sporobolus wrightii	Giant Sacaton	1 Gallon	See Detail 5, Sheet 5	575
Prosopis juliflora	Velvet Mesquite	Tall Pot	See Detail 3, Sheet 5	800
			TOTAL	1,950

WestLand Resources, Inc.
Engineering and Environmental Consultants
4001 E. Paradise Falls Drive
Tucson, Az 85712 (520) 206-9585

Two working days before you dig CALL FOR THE BLUESTAKES 1-800-782-5348 1-800-STAKE IT Blue Stake Center CALL COLLECT

NO.	REVISION	DATE

REGISTERED LANDSCAPE ARCHITECT 37110 JOHN S. ANDERSON 12/02/15 ARIZONA, U.S.A. Expires 12-31-2016

Villages at Vigneto
(formerly Whetstone Ranch)
CORPS FILE NO. SPL 2003-00826-SDM
IMPLEMENTATION PLANS FOR THE HMMP
OFFSITE MITIGATION PARCEL
PLANTING AND FENCING PLAN

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SHEET
JSA, RWS,KAS	JSA,KAS	JSA,RWS	2 OF 8
DATE: 12/02/15	PROJECT NO.: 460.76	SCALE:	

WESTLAND RESOURCES DRAWING PATH
\\Wmfile\cad\Jobs\400's\460.76\LA\DWG\460.76-LS-Sheets.dwg
Dec 02, 2015 - 9:44am

SPECIES LIST B

SYMBOL	BOTANICAL NAME	COMMON NAME	SIZE	NOTE	QUANTITY THIS AREA
TREES					
	Celtis laevigata var. reticulata	Netleaf Hackberry	Tall Pot w/ DriWater	See Detail 4, Sheet 5	15
	Chilopsis linearis	Desert Willow	Tall Pot w/ DriWater	See Detail 4, Sheet 5	33
	Fraxinus velutina	Arizona Ash	1 Gal.	Plant in perennial reach	10
	Juglans major	Arizona Walnut	1 Gal.	Plant in perennial reach	21
	Populus freemontii	Cottonwood	1 Gal.	Plant in perennial reach	21
	Prosopis juliflora	Velvet Mesquite	Tall Pot w/ DriWater	See Detail 4, Sheet 5	50
				TOTAL	150

LEGEND

ARTESIAN SPRING RECLAMATION AREA
WIDTH = 60'
AREA = APPROXIMATELY 1.1 ACRES

EXISTING ARTESIAN SPRING

EXISTING ARTESIAN SPRING
DRAINAGE CHANNEL CENTER LINE

EXISTING REACH OF PERENNIAL MOISTURE

NOTES

1. CONFIRM LOCATIONS OF EXISTING ARTESIAN SPRING, PERENNIAL MOISTURE REACH & DOWNSTREAM DRAINAGE. REPORT TO OWNER'S REPRESENTATIVE DISCREPANCIES FROM THIS PLAN.
2. STAKE LIMITS OF RECLAMATION AREA FOR REVIEW & APPROVAL BY OWNER'S REPRESENTATIVE PRIOR TO DISTURBING SITE.
3. DO NOT DISTURB EXISTING WELLHEAD. COORDINATE WITH OWNER'S REPRESENTATIVE.
4. REMOVE ALL OTHER EXISTING PIPES, CONCRETE & OTHER CONSTRUCTION MATERIALS WITHIN RECLAMATION AREA. DISPOSE OF LEGALLY OFFSITE.
5. CLEAR & GRUB EXISTING TAMARISK WITHIN RECLAMATION AREA & LEGALLY DISPOSE OF.
6. FLAG TREE LOCATIONS FOR REVIEW & APPROVAL BY OWNER'S REPRESENTATIVE. REFER TO PLANT PLAN & SPECIES LIST B THIS SHEET FOR TREE TYPES & LOCATIONS.
7. INSTALL TREES ON SITE. TREES TO BE PROVIDED BY OWNER. CONTRACTOR RESPONSIBLE FOR INSTALLATION SCHEDULE & SHIPMENT OF TREES TO SITE.
8. MAINTAIN TREES PER SPECIFICATIONS.
9. TILL & SEED RECLAMATION AREA. SEE SPECIFICATIONS. AVOID DISTURBING NEW & EXISTING NATIVE VEGETATION AS IDENTIFIED BY OWNER'S REPRESENTATIVE.

WestLand Resources, Inc.
Engineering and Environmental Consultants
4001 E. Paradise Falls Drive
Tucson, Az 85712 (520) 206-9585

50' 0' 50'
SCALE: 1" = 50'
north

DATE	REVISION	NO.

REGISTERED LANDSCAPE ARCHITECT
37108
JOHN S. ANDERSON
11/17/15
Signed
ARIZONA, U.S.A.
Expires 12-31-2016

Villages at Vigneto
(formerly Whetstone Ranch)
CORPS FILE NO. SPL 2003-00826-SDM
IMPLEMENTATION PLANS FOR THE HMMP
OFFSITE MITIGATION PARCEL
ARTESIAN SPRING RECLAMATION AREA

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SHEET
JSA, RWS,KAS	JSA,KAS	JSA,RWS	3
DATE	PROJECT NO.	SCALE:	OF
11/17/15	460.76		8

WESTLAND RESOURCES DRAWING PATH
M:\Jobs\400's\460.76\LA\DWG\460.76-LS-Sheets.dwg
Nov 17, 2015 - 4:21pm

KEY NOTES ⬡

1. EXISTING BARBED WIRE FENCE. DO NOT DISTURB.
2. NEW BARBED WIRE FENCE. SEE DETAIL 1, SHEET 5.
3. NEW 15' WIDE BARBED WIRE GATE. SEE DETAIL 3, SHEET 5. LOCATION OF GATE TO BE APPROVED BY OWNERS REPRESENTATIVE.
4. NEW ROCK CHUTE. SEE SHEETS 6 & 7.
5. CONSTRUCTION ACCESS ROUTE. SEE SHEET 6.

NOTES

1. STAKE LIMITS OF RECLAMATION AREA FOR REVIEW & APPROVAL BY OWNER'S REPRESENTATIVE PRIOR TO DISTURBING SITE.
2. PRIOR TO START OF WORK, CONTRACTOR TO OBTAIN (3) 1-QUART SOIL SAMPLES FROM THIS AREA. SEE SPECIFICATIONS.
3. PRIOR TO START OF WORK, CONTRACTOR TO REVIEW WITH OWNER'S REPRESENTATIVE SCHEDULE OF ACTIVITIES WITHIN THIS AREA. INTENT IS TO MINIMIZE CONFLICTS BETWEEN PLANTING OF CONTAINER STOCK & SEEDING WORK.
4. REMOVE EXISTING PIPES, CONCRETE & OTHER CONSTRUCTION MATERIALS WITHIN RECLAMATION AREA. DISPOSE OF LEGALLY OFFSITE.
5. CLEAR & GRUB EXISTING TAMARISK WITHIN RECLAMATION AREA & LEGALLY DISPOSE OF. SEE ALSO SHEET 6 FOR VEGETATIVE CLEARING FOR ACCESS ROUTE.
6. FLAG TREE & SHRUB LOCATIONS FOR REVIEW & APPROVAL BY OWNER'S REPRESENTATIVE.
7. INSTALL TREES AND SHRUBS ON SITE. TREES & SHRUBS TO BE PROVIDED BY OWNER. CONTRACTOR RESPONSIBLE FOR INSTALLATION SCHEDULE & SHIPMENT OF TREES & SHRUBS TO SITE. SEE SPECIES LIST C THIS SHEET FOR PLANT SPECIES, CONTAINER SIZES & IRRIGATION SCHEDULE THIS AREA.
8. MAINTAIN TREES & SHRUBS PER SPECIFICATIONS.
9. RIP OR TILL RECLAMATION AREA TO A DEPTH OF 6". AVOID DISTURBING NEW & EXISTING NATIVE VEGETATION AS IDENTIFIED BY OWNER'S REPRESENTATIVE. TILL PARALLEL TO THE CONTOUR. LEAVE GRADES IN ROUGHENED CONDITION.
10. SEED TILLED AREAS WITH NATIVE SEED MIX. REFER TO SPECIFICATIONS.
11. INSTALL STRAW WATTLE AS DIRECTED BY OWNER'S REPRESENTATIVE & AS SHOWN ON DETAIL 1, SHEET 7. TOTAL AMOUNT OF STRAW WATTLES TO BE INSTALLED OVER LIFE OF PROJECT (INCLUDING MAINTENANCE PERIOD) = 5,000 LINEAR FEET MAXIMUM.

SPECIES LIST C

BOTANICAL NAME	COMMON NAME	SIZE	NOTE	QUANTITY THIS AREA
Acacia constricta	White Thorn Acacia	Tall Pot	See Detail 4, Sheet 5	50
Acacia greggii	Cat Claw Acacia	Tall Pot	See Detail 4, Sheet 5	50
Celtis pallida	Desert Hackberry	1 Gallon	See Detail 5, Sheet 5	100
Sporobolus airoides	Alkali Sacaton	1 Gallon	See Detail 5, Sheet 5	100
Sporobolus wrightii	Giant Sacaton	1 Gallon	See Detail 5, Sheet 5	100
Prosopis juliflora	Velvet Mesquite	Tall Pot	See Detail 4, Sheet 5	100
			TOTAL	500

50' 0' 50' north

SCALE: 1" = 50'

WestLand Resources, Inc.
Engineering and Environmental Consultants
4001 E. Paradise Falls Drive
Tucson, Az 85712 (520) 206-9585

Two working days before you dig CALL FOR THE BLUESTAKES 1-800-782-5348 1-800-STAKE IT Blue Stake Center CALL COLLECT

DATE	REVISION	NO.

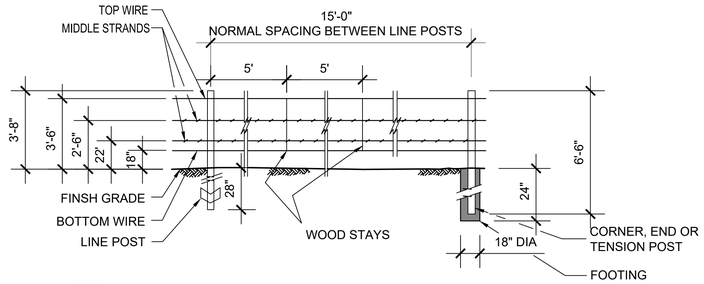
REGISTERED LANDSCAPE ARCHITECT 37108 JOHN S. ANDERSON 11/17/15 ARIZONA, U.S.A.

Expires 12-31-2016

Villages at Vigneto
(formerly Whetstone Ranch)
CORPS FILE NO. SPL 2003-00826-SDM
IMPLEMENTATION PLANS FOR THE HMMP
OFFSITE MITIGATION PARCEL
SOUTHWEST CORNER RECLAMATION AREA

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SHEET
JSA, RWS,KAS	JSA,KAS	JSA,RWS	4
DATE: 11/17/15	PROJECT NO.: 460.76	SCALE:	OF 8

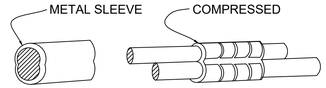
WESTLAND RESOURCES DRAWING PATH
M:\Jobs\400's\460.76\LA\DWG\460.76-LS-Sheets.dwg
Nov 17, 2015 - 4:22pm



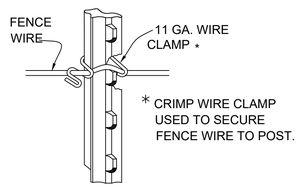
NOTES:
1. TOP & BOTTOM WIRE STRANDS = SMOOTH WIRE 11-GAGE.
2. MIDDLE STRANDS = BARBED WIRE, 2-POINT PATTERN, 12½-GAGE GALVANIZED STEEL WIRE SPACED 5" O.C. CONFORMING TO ASTM A-121.
3. END, CORNER & TENSION POSTS = 3/16" STEEL PIPE. DIAMETER = 3".
4. LINE POST = #133 STUDDED TEE POST.
5. SECURE WIRE TO POSTS USING MINIMUM 12½ GAGE TIE WIRE.
6. MAXIMUM DISTANCE BETWEEN TENSION POSTS = 800'.
7. FOOTINGS SHALL BE CLASS B CONCRETE.

1 BARBED WIRE FENCE WITH METAL POSTS DETAIL

SCALE: N.T.S.



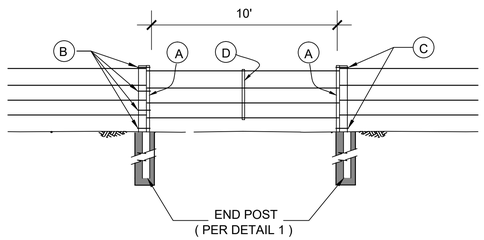
WIRE SPLICE



TIES FOR STEEL T POST

2 WIRE TIES AND SPLICE DETAIL

SCALE: N.T.S.



(A) 2" DIA x 4' WOODEN STAYS

(B) (4) NO. 12 1/2 GA. WIRE LOOPS TO ACT AS HINGES

(C) (2) NO.12 1/2 GA. WIRE LOOPS

(D) 2" x 2" NOMINAL WOODEN STAYS EQUALLY SPACED 3' O.C. MAX.

3 WIRE GATE DETAIL

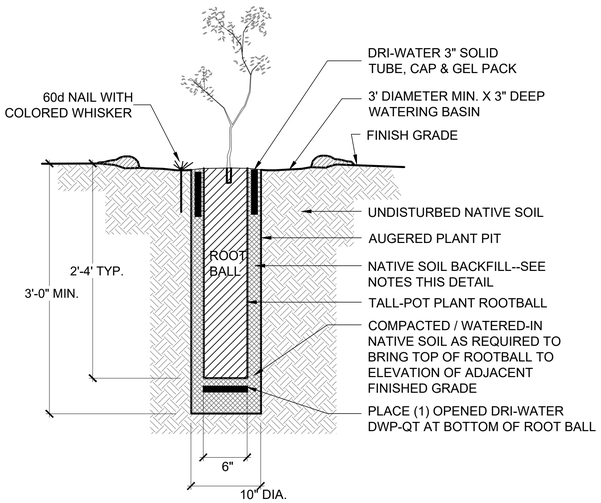
SCALE: N.T.S.

BARBED WIRE FENCE & GATE NOTES:

ALL MATERIAL DIMENSIONS AND WEIGHT ON THIS STANDARD ARE NOMINAL UNLESS OTHERWISE INDICATED.

FENCE WIRE SHALL BE ENDED, DOUBLE WRAPPED AND TIED OFF AT CORNER, END & TENSION POSTS. FENCE TO BE CONTINUED SHALL THEN BE RESTARTED IN LIKE MANNER.

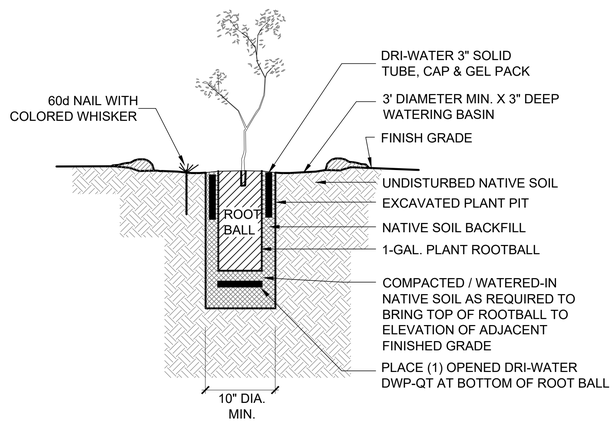
FENCE WIRE SHALL BE PLACED ON EITHER ROAD OR FIELD SIDE OF POSTS DEPENDING ON LOCAL CONDITIONS, I.E. ON CURVES, THE WIRE SHALL BE PLACED ON THE SIDE OF THE POST WHICH WILL RESULT IN THE LEAST TENSION ON FENCE TIES. THIS WILL ALSO APPLY WHERE WIND DRIFT, TUMBLE WEEDS OR OTHER CONDITIONS WOULD EXERT UNUSUAL PRESSURE AGAINST THE WIRE. WHERE POSSIBLE, WIRE SHOULD BE PLACED ON THE LIVESTOCK SIDE OF THE POSTS.



NOTES:
1. EXCAVATED PLANT PITS SHALL BE FILLED WITH WATER AND ALLOWED TO DRAIN TWO TIMES PRIOR TO THE PLANTING OF THE TALL-POT PLANT.
2. PLACE DRI-WATER IN BOTTOM OF PLANT PIT.
3. REMOVE SCREEN FROM BOTTOM OF TALL-POT.
4. PLACE TALL-POT INTO PLANT PIT WHILE STILL IN TALL-POT CONTAINER.
5. LIFT TALL-POT CONTAINER OUT OF PLANT PIT WHILE BACKFILL IS PLACED. PLANTING AND BACKFILL SHALL BE A TWO-MAN OPERATION.
6. INSTALL DRI-WATER TUBE & GEL NEAR TOP OF PLANT PIT. INSTALL PER MANUFACTURER'S SPECIFICATIONS.
7. AFTER BACKFILL IS PLACED, WATER PLANT TO FULL DEPTH OF PLANT PIT.
8. UNDAMAGED TALL-POT CONTAINERS SHALL BE RETURNED TO THE OWNER.
9. INTENT OF WHISKER IS TO ASSIST IN LOCATING PLANT DURING MAINTENANCE PERIOD.

4 TALL POT PLANTING w DRI-WATER IRRIGATION

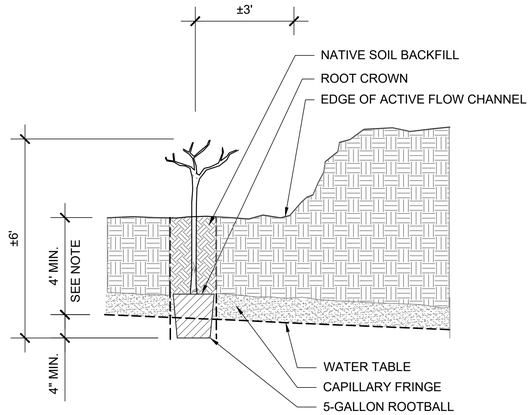
SCALE: N.T.S.



NOTES:
1. EXCAVATED PLANT PITS SHALL BE FILLED WITH WATER AND ALLOWED TO DRAIN TWO TIMES PRIOR TO THE PLANTING OF THE 1-GALLON PLANT.
2. PLACE DRI-WATER IN BOTTOM OF PLANT PIT.
3. INSTALL DRI-WATER TUBE & GEL NEAR TOP OF PLANT PIT. INSTALL PER MANUFACTURER'S SPECIFICATIONS.
4. AFTER ROOTBALL IS PLACED & PLANT PIT IS BACKFILLED, WATER PLANT TO FULL DEPTH OF PLANT PIT.
5. INTENT OF WHISKER IS TO ASSIST IN LOCATING PLANT DURING MAINTENANCE PERIOD.

5 1-GALLON PLANTING w DRI-WATER IRRIGATION

SCALE: N.T.S.



NOTE:
1. CONFIRM DEPTH TO WATER TABLE AT 5 LOCATIONS WITHIN PROPOSED PLANTING AREA WITHIN 2 WEEKS OF CONSTRUCTION. LOCATIONS TO BE APPROVED BY OWNER'S REPRESENTATIVE. DEPTH TO WATER TABLE AT EACH LOCATION TO BE REPORTED TO OWNER'S REPRESENTATIVE.

6 COTTONWOOD DEEP PLANTING INSTALLATION DETAIL

SCALE: N.T.S.

WestLand Resources, Inc.
Engineering and Environmental Consultants
4001 E. Paradise Falls Drive
Tucson, Az 85712 (520) 206-9585

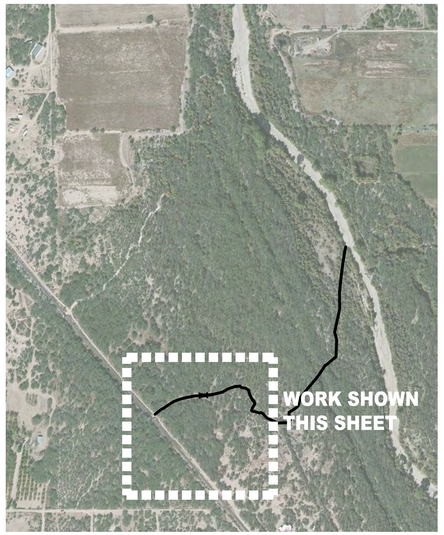
DATE	REVISION	NO.

REGISTERED LANDSCAPE ARCHITECT
37106
JOHN S. ANDERSON
11/17/15
Date Signed
ARIZONA, U.S.A.
Expires 12-31-2016

Villages at Vigneto
(formerly Whetstone Ranch)
CORPS FILE NO. SPL 2003-00826-SDM
IMPLEMENTATION PLANS FOR THE HMMP
OFFSITE MITIGATION PARCEL
FENCE & PLANTING DETAILS

DESIGNED BY:	DRAWN BY:	CHECKED BY:	SHEET
JSA, RWS,KAS	JSA,KAS	JSA,RWS	5
DATE	PROJECT NO.	SCALE:	OF
11/17/15	460.76		8

WESTLAND RESOURCES DRAWING PATH
M:\Jobs\400's\460.76\LA\DWG\460.76-LS-DTLs.dwg
Nov 17, 2015 - 4:01pm



AREA LOCATION PLAN

NOTES:

1. WIDTH OF CONSTRUCTION ACCESS ROUTE = 16'.
2. CONSTRUCTION ACCESS ROUTE & LIMITS OF CLEARING TO BE STAKED FOR REVIEW & APPROVAL BY OWNERS REPRESENTATIVE PRIOR TO CONSTRUCTION.
3. CONTRACTOR TO STAKE LIMITS OF DISTURBANCE ASSOCIATED WITH ROCK CHUTE FOR REVIEW & APPROVAL BY OWNER'S REPRESENTATIVE PRIOR TO CONSTRUCTION. MAXIMUM ALLOWABLE LIMIT OF DISTURBANCE = 30' FROM EDGE OF CONSTRUCTED IMPROVEMENTS. EXISTING TREES TO BE PRUNED OR CUT ONLY AS APPROVED.
4. CONTRACTOR TO LEGALLY DISPOSE OF ALL CLEARED VEGETATION.
5. CONTRACTOR TO STAKE LAYOUT OF ROCK CHUTE FOR REVIEW & APPROVAL BY OWNER'S REPRESENTATIVE PRIOR TO CONSTRUCTION.
6. CONTRACTOR TO REPLACE AND COMPACT DISTURBED SOILS TO PRE-CONSTRUCTION GRADE PER GEOTECHNICAL ENGINEER'S RECOMMENDATIONS.
7. CONTRACTOR TO HAUL EXCESS EXCAVATED MATERIAL GENERATED BY CONSTRUCTION OF ROCK CHUTE TO SOUTHWEST CORNER RECLAMATION AREA--SEE SHEET 4. MATERIAL TO BE SPREAD AROUND SITE & BLENDED INTO EXISTING GRADES TO FORM A SMOOTH & EVEN FINISH. AVOID DAMAGE TO EXISTING NATIVE VEGETATION.
8. FOLLOWING CONSTRUCTION OF ROCK CHUTE, RESTORE DISTURBED GRADES TO ORIGINAL CONDITION. RIP OR TILL DISTURBED SOILS TO A DEPTH OF 6". SEED TILLED SOILS WITH NATIVE SEED MIX. REFER TO SPECIFICATIONS.

N
W E
S

50' 25' 0' 50'

SCALE: 1" = 50'

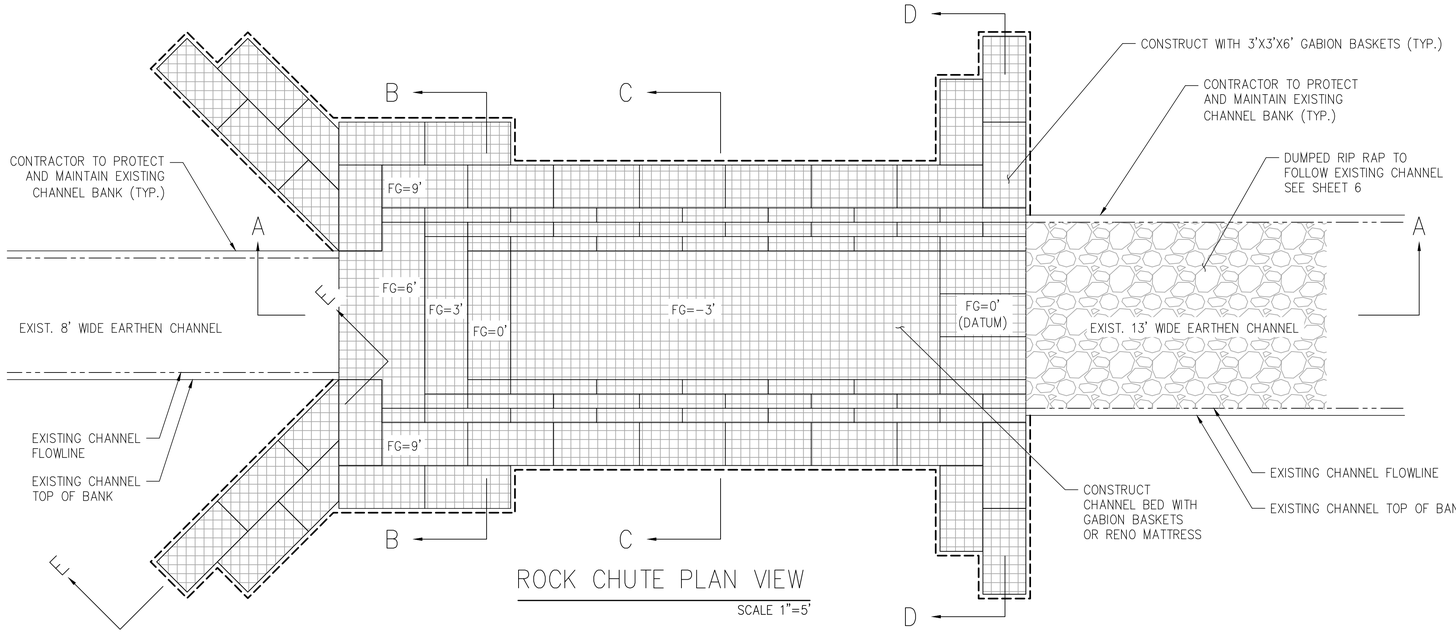
WestLand Resources, Inc.
Engineering and Environmental Consultants
4001 E. Paradise Falls Drive
Tucson, Az 85712 (520) 206-9585

Two working days before you dig
CALL FOR THE BLUESTAKES
1-800-782-5348
1-800-STAKE IT
Blue Stake Center
CALL COLLECT

DATE	REVISION	NO.

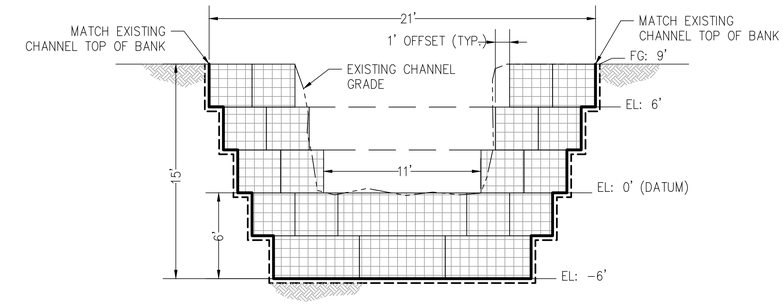
Villages at Vigneto
(formerly Whetstone Ranch)
CORPS FILE NO. SPL 2003-00826-SDM
IMPLEMENTATION PLANS FOR THE HMMP
OFFSITE MITIGATION PARCEL
EROSION CONTROL PLAN

DESIGNED BY: LRH	DRAWN BY: LRH	CHECKED BY: EDC/ MC	SHEET 6
DATE 11/17/15	PROJECT NO. 460.76	SCALE:	OF 8
WESTLAND RESOURCES DRAWING PATH M:\Jobs\460\460.76\LA\DWG\460.76-ECP-Sheets.dwg Nov 17, 2015 - 4:17pm			



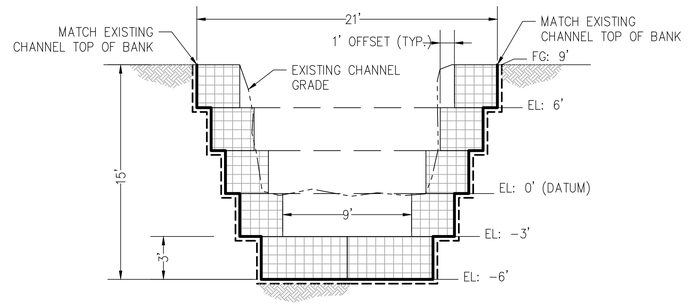
ROCK CHUTE PLAN VIEW

SCALE 1"=5'



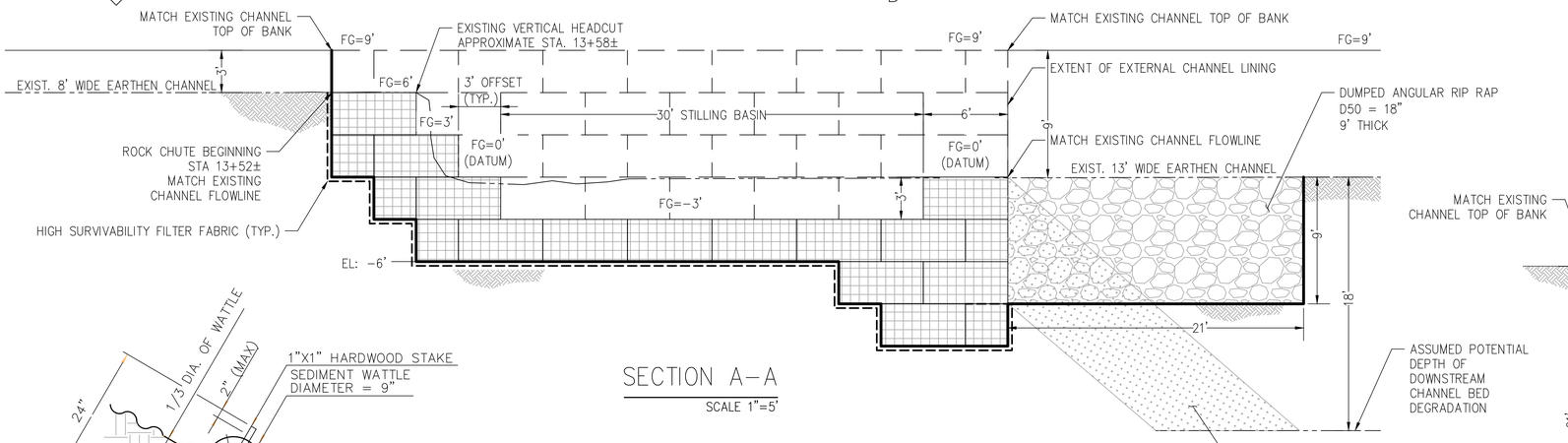
SECTION B-B

SCALE 1"=5'



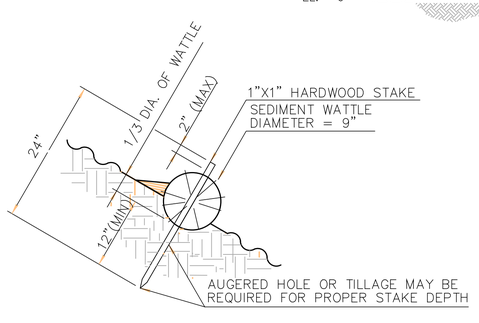
SECTION C-C

SCALE 1"=5'

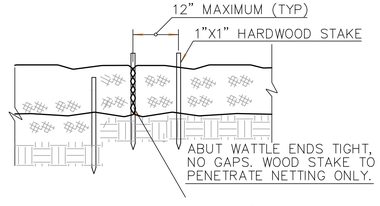


SECTION A-A

SCALE 1"=5'



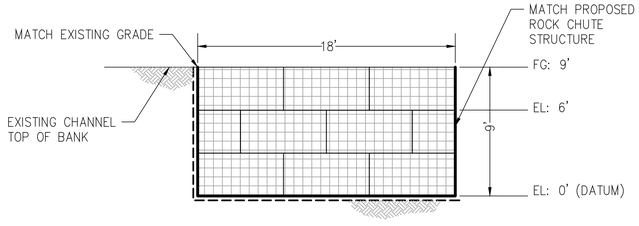
SEDIMENT WATTLE STAKING DETAIL



SEDIMENT WATTLE OVERLAP

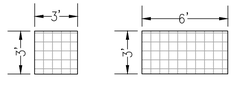
1 SEDIMENT WATTLE

SCALE: N.T.S.



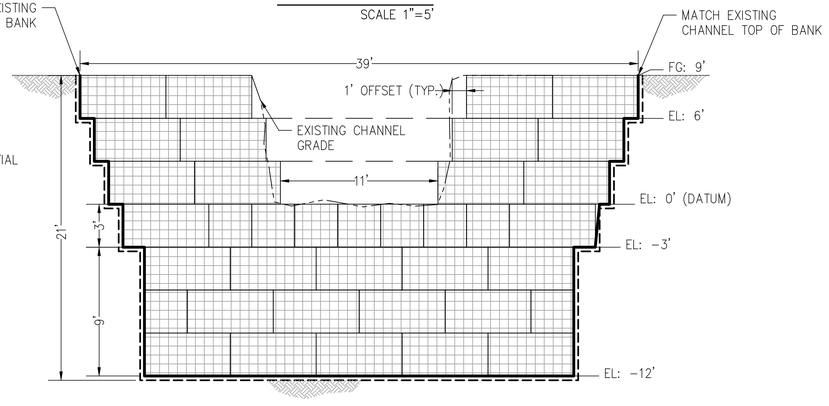
SECTION E-E

SCALE 1"=5'



GABION TYPICAL DETAILS

SCALE 1"=5'



SECTION D-D

SCALE 1"=5'

NOTE:
ALL EXISTING CHANNEL DIMENSIONS ARE APPROXIMATE AND REQUIRE FIELD VERIFICATION BY CONTRACTOR PRIOR TO CONSTRUCTION.

WestLand Resources, Inc.
Engineering and Environmental Consultants
4001 E. Paradise Falls Drive
Tucson, Az 85712 (520) 206-9585

DATE	REVISION	NO.

Villages at Vigneto
(formerly Whetstone Ranch)
CORPS FILE NO. SPL 2003-00826-SDM
IMPLEMENTATION PLANS FOR THE HMMP
OFFSITE MITIGATION PARCEL
EROSION CONTROL DETAILS

DESIGNED BY: LRH	DRAWN BY: LRH	CHECKED BY: EDC/MC	SHEET 7
DATE 11/17/15	PROJECT NO. 460.76	SCALE:	OF 8
WESTLAND RESOURCES DRAWING PATH M:\Jobs\400's\460.76\LA\DWG\460.76-EC-DTLs.dwg Nov 17, 2015 - 3:57pm			

GENERAL NOTES

1. The Contractor is required to visit the proposed site and familiarize him/her self with existing site conditions prior to submitting a bid for the project.
2. Contractor shall demonstrate several successful projects with plants and project site conditions similar to this project.
3. The work shown on these plans will be performed in phases as directed by the Owner or the Owner's Representative.
4. Pre-construction conference: prior to commencing work on the project, the Contractor shall arrange an on-site conference with the Owner or the Owner's Representative. The Owner or Owner's Representative will present to the Contractor the proposed schedule for phases of work. The Contractor will present proposed equipment and methods for accomplishing work and proposed sequence of activities to complete work. No material or equipment shall be ordered and work shall not begin until the proposed schedule, equipment and sequence of activities has been approved, in writing, by the Owner's Representative.
11. The Owner's Representative will stake the property lines prior to the start of work.
12. The Contractor shall be responsible for the care, maintenance, repair or replacement of existing improvements in the work area which are removed or damaged during the course of construction. All repair, replacement, or cleanup shall be done to the satisfaction of the Owner.
13. Prior to cutting into the soil the Contractor shall locate all underground utilities and take proper precaution not to disturb them. Any damage to underground utilities or structures shall be repaired at the Contractor's expense.
14. Contractor shall comply with all applicable occupational safety and health administration regulations.
15. Contractor shall obtain local permits required by governmental agencies.
16. Contractor shall prepare a Storm Water Protection Plan.
17. If unanticipated conditions are encountered during the course of the construction and are beyond the scope of the design, the Contractor shall immediately notify the Owner's Representative. The Owner's Representative shall submit the necessary revised or supplemental plans for review and approval.
18. A copy of this plan shall be kept in an easily accessible location on the site at all times during construction.
19. Contractor shall remove all construction debris, damaged fencing & vegetation from the project site and legally dispose of these materials off site.
20. The Contractor shall operate in a manner compliant with all applicable regulations of the town, county, state and federal government.
21. The Contractor shall be responsible for maintaining and protecting all planted areas, including the care and protection of trees, shrubs and plants specified in these plans. Such care and protection shall include, but not be limited to, the watering of stock; removal of construction trash and debris; eradicating and removing all weeds and undesirable vegetation; repairing weather damage or damage caused by the public; furnishing and applying sprays, dust and/or cages to combat vandalism, disease, insects and pests; and taking all precautions necessary to prevent damage from cold, frost, sunburn or other hazards.

PLANTING & IRRIGATION

1. Unless otherwise specified in the project documents, all plant material shall be provided by the Owner.
2. Prior to installation of new plant material, the Contractor shall be responsible for obtaining soil samples as directed in project plans for submittal to Crop Production Services for horticultural analysis. Contractor shall submit results of soils analysis to Owner's Representative.
3. Prior to delivery of any plant material to the project site, the Contractor shall schedule a pre-construtions conference with the Owner's Representative as discussed under General Notes. At that conference, the Contractor shall coordinate with the Owner's Representative the proposed schedule for the delivery of plant material.
4. The Contractor shall arrange for pickup of plant material from the nurseries and for delivery to the project site. The nurseries will not warranty the plants provided. The Contractor has the option to refuse selected plants from the nurseries due to ill health or poor form or other reasons. Stock shall be sound, healthy, and vigorous; free from insect pests, sun scald, excessive bark abrasions and other objectionable disfigurements. They shall have normal, well-developed branch systems and vigorous, fibrous root systems. Any plants found to be unsuitable in growth or condition or which are not true to name shall be removed and replaced with acceptable plants. Once the plants are accepted by the Contractor, the Contractor bears responsibility for the survival and health of those plants and shall replace any that fail.
5. Prior to shipping, all plants shall be handled, prepared and packed for shipment with care and skill, in accordance with recognized standard practice for the kind of plant involved. The root systems of all plants shall not be permitted to dry out at any time. While in transit, plants shall be protected at all times against freezing temperatures, the sun, the wind and other adverse weather conditions. Plants shall be transported in closed vehicles. During transportation, plants shall receive adequate ventilation to prevent "sweating." Plants delivered in a wilted condition will be rejected.
6. Plants transported to the site shall be planted as soon as possible. During any interim storage period, they shall not be exposed to excessive sun or drying winds. Any stock that, in the opinion of the Owner's Representative, has deteriorated due to exposure or has been damaged during transporting will be removed and replaced at the Contractor's expense.
7. All container plants accepted by the Contractor shall conform to the applicable requirements specified in the current edition of "American Standard for Nursery Stock" as approved by the American National Standards Institute, Inc., and sponsored by the American Association of Nurserymen, Inc., subject to variations in size and measurement when specified on the project plans or in the Special Provisions.
8. All plants accepted by the Contractor shall be true to type and species shown on the project plans and at least one plant in each group of plants of the same species delivered to the project shall be tagged with a weatherproof label stating both the botanical and common name of the plants in that group.
9. All plants accepted by the Contractor shall comply with Federal and State laws requiring inspection for diseases and infestations. All rejected plants shall be removed from the project immediately upon rejection by the Owner's Representative.
10. Prior to installation of plant material, areas to be planted shall be graded to the lines and grades designated on the project plans and as approved by the Owner's Representative. Subject to the Owner's Representative approval, minor relocations may be accomplished at this time to avoid unsuitable conditions, such as utilities, rocky areas, poor soil, etc.
11. The Contractor shall stake out the locations of plants for review and approval by the Owner's Representative prior to any plant pit excavation as noted on the project plans.
12. All containers shall be opened and removed in such a manner that the roots of the plant are not damaged. The backfill will be thoroughly settled by tamping and watering and as shown on project plans so that all voids are filled.
13. Irrigation as shown on project plans and shall be installed concurrently with planting operations.
14. The Contractor shall maintain and be responsible for all plant material on a continuous basis as installations are completed during the course of work and prior to Substantial Completion. Maintenance will include maintenance of Dri-Water gels, protection from trespass, weeding of invasive species (especially tamarisk), and removal of trash. At the Artesian Spring Reclamation Area (Sheet 3), the Contractor is responsible for protection of plants from herbivores (rodents, rabbits, deer, etc.); sprays and/ or wire cages may be required to prevent damage. At all other areas, Contractor shall closely monitor new plants for damage caused by herbivores and shall immediately advise the Owner's Representative if such damage occurs.
15. The Contractor shall remove and replace, at no additional cost to the Owner, all dead plants and all plants that show signs of failure to grow or which are injured or damaged so as to render them unsuitable for the purpose intended, as determined by the Owner's Representative.
16. Following installation of plant material in each planting area, the Contractor shall schedule an inspection by the Owner's Representative to review for conformance with the project plans for that area.
17. Following approval of all installed plant material, the Owner's Representative shall issue Substantial Completion to the Contractor in writing. Once Substantial Completion has been issued, the Landscape Maintenance Period begins.

APPLICATION OF NATIVE SEED

Native seed shall be applied as a Hydroseed Mix described in Section 805 of the PAG Standard Specifications, including the requirement that all soils to be seeded are to be ripped or tilled to a depth of 6" parallel with the contours, with the following exceptions:

805-2.02: The seed mix shall be as follows:

SEED MIX:

Species	Common Name	Rate, PLS lbs/acre
Grasses		
Aristida purpurea	Purple three awn	1.0
Bothriochloa barbinodes	Cane beardgrass	0.5
Bouteloua curtipendula var. 'Vaughns'	Side oats grama	2.0
Bouteloua rothrockii	Rothrock's grama	0.5
Digitaria californica	Arizona cottontop	0.5
Heteropogon contortus	Tanglehead	0.5
Sporobolus cryptandrus	Sand dropseed	0.25
Sporobolus contractus	Spike dropseed	0.25
Wildflowers(forbs		
Baileya multiradiata	Desert marigold	1.0
Dyssodia spp.	Fetid marigold	0.25
Cassia couesii	Desert senna	1.0
Escholtzia Mexicana	Mexican gold poppy	2.0
Kallstroemia grandiflora	Summer poppy	0.5
Lesquerella gordoni	Bladder pod	1.0
Lupinus sparsiflorus	Desert lupine	1.0
Penstemon parryi	Parry's penstemon	0.5
Phacelia crenulata	Arizona bluebells	1.0
Plantago insularis	Indian wheat	2.0
Salvia columbaria	Desert chia	0.25
Sphaeralcea ambigua	Desert globemallow	0.5
Shrubs		
Ambrosia deltoides	Triangle leaf bursage	3.0
Ambrosia dumosa	White bursage	3.0
Atriplex canescens	Four wing saltbush	0.5
Atriplex polycarpa	Desert saltbush	0.25
Calliandra eriophylla	Fairy duster	0.5
Encelia farinosa	Brittle bush	0.5
Eriogonum fascsiculatum var. 'polifolium'	Arizona Flat top buckwheat	0.5
Larrea tridentata	Creosote bush	4.0
Trees(woody species)		
Acacia constricta	White thorn acacia	0.5
Acacia greggii	Cat claw acacia	2.0
Cercidium microphyllum	Foothills palo verde	3.0
Prosopis velutina	Velvet mesquite	0.25

The slurry mix and soil amendments shall be applied per (C) Un-irrigated areas.
805-3.02 Classes of Seeding: Seed shall be applied as described in Class II.

LANDSCAPE MAINTENANCE

1. The Landscape Maintenance Period will begin immediately following issuance of Substantial Completion by the Owner's Representative in writing. The Landscape Maintenance Period shall last for 12 months.
2. Contractor to submit maintenance schedule to Owner's Representative for approval. Contractor shall visit site at least once per month during Maintenance Period.
3. Except were noted otherwise in these Specifications, the Contractor shall warrant that 80% of all installed nursery-grown plants will be alive and in good health at the conclusion of the Maintenance Period except for abuse or damage by others.
4. The Contractor shall warrant that 80% of the Deep Planted Cottonwoods as described in Key Note 5, Sheet 2 will be alive and in good health 30 days after installation is complete.
5. The Contractor shall replace DriWater gels as necessary for new plant health.
6. At the conclusion of the Maintenance Period, the Contractor will remove DriWater sleeves from the field and turn over to the Owner at a location determined by the Owner.
7. The Contractor shall repair damage to slopes caused by erosion.
8. The Contractor shall weed and provide insect control during Maintenance Period.
9. The control of weeds/invasive species shall be accomplished either with herbicides or by manual methods. Known weeds and/or invasive species are Tamarisk, Russian Thistle, Arizona Thistle, Camelthorn and Halogeton. The types of herbicides to be used and the methods of application shall conform to Environmental Protection Agency requirements and labeling instructions. The Contractor shall keep a record of all applications; the type of herbicides used, such as pre- or post-emergent; the rate and method of applications; and the date and location of such applications. A copy of this record shall be submitted to the Owner's Representative after each application. The Contractor shall notify the Owner's Representative and obtain prior approval for the use of any chemicals for weed control or eradication.
10. The Contractor shall use the Best Management Practices (BMP's) for weed control as outlined in the US Department of Agriculture - Forest Service Guide to Noxious Weed Prevention Practices. The Contractor shall refer to federal and state weed lists for identification. The Guide uses the term “weed” to include all plants defined as “noxious weeds” by U.S. Forest Service policy. Noxious weeds generally possess one or more of the following characteristics: aggressive and difficult to manage, poisonous, toxic, parasitic, a carrier or host of serious insects or disease, and being native or new to or not common to the United States or parts thereof.
11. Any person or persons applying pesticides will be considered as doing so for hire and shall be required to be licensed in accordance with the requirements of Title 3, Chapter 2, Arizona Revised Statutes, Article 6, Section 3-377. The Contractor shall notify the Owner's Representative and obtain prior approval for the use of any chemicals for pesticides.
12. The Landscape Maintenance Period may be extended if the project is not being adequately maintained in the opinion of the Owner's Representative. At the end of this period, all plant material shall be in a healthy growing condition.
13. The Contractor shall request in writing, a final inspection at the completion of the Maintenance Period. If the Owner's Representative determines the work is satisfactory, the Maintenance Period will end on the date of the final inspection. If the work is unsatisfactory, the Maintenance Period will be extended at the Contractor's expense, until such time as all corrections are made and the work is inspected and approved by the Owner's Representative. Retention will not be released until final inspection is made and approval issued by the Owner's Representative.

BARBED WIRE FENCE NOTES:

ALL MATERIAL DIMENSIONS AND WEIGHT ON THIS STANDARD ARE NOMINAL UNLESS OTHERWISE INDICATED.

FENCE WIRE SHALL BE ENDED, DOUBLE WRAPPED AND TIED OFF AT END POSTS, ANGLE POSTS AND LINE BRACE POSTS. FENCE TO BE CONTINUED SHALL THEN BE RESTARTED IN LIKE MANNER.

FENCE WIRE SHALL BE PLACED ON THE SIDE OF THE POST WHICH WILL RESULT IN THE LEAST TENSION ON FENCE TIES. THIS WILL ALSO APPLY WHERE WIND DRIFT, TUMBLE WEEDS OR OTHER CONDITIONS WOULD EXERT UNUSUAL PRESSURE AGAINST THE WIRE. WHERE POSSIBLE, WIRE SHOULD BE PLACED ON THE LIVESTOCK SIDE OF THE POSTS.

METAL POSTS:
ALL POSTS AND BRACES SHALL BE OF THE TYPES AND WEIGHTS SHOWN.

FOOTINGS OR BASES:
CONCRETE SHALL BE CLASS B.
CONCRETE WITH LIGHTWEIGHT AGGREGATES CONFORMING TO AASHTO M 195 (ASTM C 330) WILL BE PERMITTED.

END, CORNER AND LINE BRACE POSTS
TYPE- 3" GALVANIZED STEEL PIPE
LENGTH- 6' 6" MINIMUM
WEIGHT - 16 LBS/LINEAR FOOT ± 5%
LENGTH - 6'-6" MINIMUM

WestLand Resources, Inc.
Engineering and Environmental Consultants
4001 E. Paradise Falls Drive
Tucson, Az 85712 (520) 206-9585

DATE	REVISION	NO.

REGISTERED LANDSCAPE ARCHITECT
37106
JOHN S. ANDERSON
11/17/15
Date Signed
USA
Expires 12-31-2016

Villages at Vigneto
(formerly Whetstone Ranch)
CORPS FILE NO. SPL 2003-00826-SDM
IMPLEMENTATION PLANS FOR THE HMMP
OFFSITE MITIGATION PARCEL
SPECIFICATIONS

DESIGNED BY: JSA, RWS,KAS	DRAWN BY: JSA,KAS	CHECKED BY: JSA,RWS	SHEET 8
DATE 11/17/15	PROJECT NO. 460,76	SCALE:	OF 8
WESTLAND RESOURCES DRAWING PATH M:\Jobs\400's\460.76\LA\DWG\460.76-Specs.dwg Nov 17, 2015 - 4:23pm			

RECORDING REQUESTED BY AND
WHEN RECORDED RETURN TO:

El Dorado Benson LLC
Attn: M. Reinbold
8501 N. Scottsdale Road. Suite 120
Scottsdale, AZ 85253

(Space Above Line for Recorder's Use)

DECLARATION OF RESTRICTIVE COVENANTS

This DECLARATION OF RESTRICTIVE COVENANTS ("**Restrictive Covenant**") is made this ____ day of _____, 20__ by El Dorado Benson, L.L.C., an Arizona limited liability company (hereinafter "**Declarant**").

R E C I T A L S

A. Declarant is the sole owner in fee simple of certain real property containing approximately 142.5 acres, located in the County of Cochise, State of Arizona, found on Assessor's Parcel Number 124-18-008D and desires to grant a restrictive covenant over the property (the "**Restricted Property**"). The Restricted Property is legally described and depicted on **Exhibit "A"** attached hereto and incorporated by this reference. The Restricted Property is located outside of the municipal boundary but within the planning boundary of the City of Benson.

B. The Restricted Property provides, among other things, compensatory mitigation for certain impacts from development of the Villages at Vigneto ("**Project**") by Declarant pursuant to requirements of (1) the United States Army Corps of Engineers' ("**ACOE**") Clean Water Act (CWA) Section 404 Permit No. 2003-00826-SDM and any amendments thereto (**"Section 404 Permit**").

C. This Restrictive Covenant is designed to satisfy and is granted in satisfaction of the Section 404 Permit.

D. Consistent with the terms and conditions of this Restrictive Covenant, the Restricted Property is and will remain in a Natural Condition as defined herein and is intended to be preserved in its natural, scenic, open condition to maintain its ecological, historical, visual and educational values (collectively, "**Conservation Values**"). The Conservation Values are of importance to the people of the County of Cochise and the people of the United States. The Restricted Property has been designated as an "Environmentally Sensitive Area" by the City of

Benson General Development Plan, the most recent version of which was adopted by the Benson City Council on February 23, 2015 by Resolution 8-2015.

E. The ACOE is the federal agency charged with the primary responsibility for regulating activities in waters of the United States, including wetlands, with regulatory authority over discharges of dredged and fill material into such waters pursuant to Section 404 of the Clean Water Act, and is a third party beneficiary of this Restrictive Covenant.

F. Following recordation and subject to Section 11 below, Declarant intends to convey all of the Restricted Property to a conservation organization or a property owners' association. Should Declarant transfer its interest in the Restricted Property prior to the time that Compensatory Mitigation (defined below) is fulfilled, the conservation organization or property owners' association will assume the roles and responsibilities of Declarant, including long-term maintenance, under this Restrictive Covenant, except that Declarant, as the developer of the Project, will remain responsible for the Compensatory Mitigation until it has been successfully implemented and completed per the success criteria set forth in the Mitigation Plan.

COVENANTS, TERMS, CONDITIONS AND RESTRICTIONS

In consideration of the above recitals and the covenants, terms, conditions, and restrictions contained herein, and pursuant to the laws of the United States and State of Arizona, including Arizona Revised Statutes 33-271, *et seq.*, Declarant hereby declares the Restricted Property shall be held, transferred, conveyed, leased, occupied or otherwise disposed of, and used subject to the following restrictive covenants (and incorporating the above recitals herein by this reference), which shall run with the land, and be binding on Declarant's heirs, successors in interest, administrators, assigns, lessees, or other occupiers and users of the Restricted Property, or any portion of it.

1. Purpose.

(a) The purposes of this Restrictive Covenant are to (1) ensure the Restricted Property will be preserved in a Natural Condition, as defined herein, in perpetuity and (2) prevent any use of the Restricted Property that will impair or interfere with the Conservation Values of the Restricted Property (the "**Purpose**"). Declarant intends that this Restrictive Covenant will confine the use of the Restricted Property to such activities that are consistent with this Purpose, including without limitation, those involving the preservation, restoration, and enhancement of native species and their habitats.

(b) The term "**Natural Condition**," as referenced in the preceding paragraph and other portions of this Restrictive Covenant, shall mean the condition of the Restricted Property as it exists at the time this Restrictive Covenant is executed, as well as future enhancements or changes to the Restricted Property that occur directly as a result of the following activities:

(1) Compensatory mitigation measures (**"Compensatory Mitigation**"), including implementation, maintenance and monitoring activities, required by the Section 404 Permit and as described in the "Habitat Mitigation and Monitoring Plan, ACOE File No. 2003-00826-SDM, Whetstone Ranch," prepared by WestLand Resources, Inc, dated November 2005, including any modification thereto approved by the ACOE (the "**Mitigation Plan**"). The cover page is attached as **Exhibit "B"**;

(2) In-perpetuity maintenance obligations ("**Long-Term Maintenance**") that occur on the Restricted Property as described in Section 14 herein.

(3) Activities described in Section 3 and Section 5 herein.

(c) Declarant represents and warrants that there are no structures or other man-made improvements existing on the Restricted Property [**OR,** the only structures or other man-made improvements existing on the Restricted Property consist of (describe)]. Declarant further represents and warrants there are no previously granted easements existing on the Restricted Property that interfere or conflict with the Purpose of this Restrictive Covenant as evidenced by the Preliminary Title Report dated November 2, 2015, attached hereto as **Exhibit "C**." The present Natural Condition is evidenced in part by the depiction of the Restricted Property attached on **Exhibit "D,"** showing all relevant and plottable property lines, easements, dedications, improvements, structures, boundaries, and major, distinct natural features such as waters of the United States. Declarant has delivered further evidence of the present Natural Condition to ACOE consisting of (1) a color aerial photograph of the Restricted Property at an appropriate scale taken _____; (2) an overlay of the Restricted Property boundaries on that aerial photograph; and (3) on-site color photographs showing all improvements, structures, and natural features of the Restricted Property.

(d) If a controversy arises with respect to the present Natural Condition of the Restricted Property, Declarant and/or ACOE shall not be foreclosed from utilizing any and all other relevant documents, surveys, photographs or other evidence or information to assist in the resolution of the controversy.

(e) The term "**Biological Monitor**" shall mean either an employee of the Declarant or an independent third-party consultant with knowledge of riparian resources in the Cochise County area and expertise in the field of biology or a related field.

2. ACOE's rights. To accomplish the Purpose of this Restrictive Covenant, Declarant hereby grants and conveys the following rights to ACOE (but without obligation of the ACOE):

(a) A non-exclusive easement on and over the Restricted Property to preserve and protect the Conservation Values of the Restricted Property; and

(b) A non-exclusive easement on and over the Restricted Property to enter upon the Restricted Property to monitor Declarant's compliance with and to otherwise enforce the terms of this Restrictive Covenant; and

(c) A non-exclusive easement on and over the Restricted Property to prevent any activity on or use of the Restricted Property that is inconsistent with the Purpose of this Restrictive Covenant and to require the restoration of such areas or features of the Restricted Property that may be damaged by any act, failure to act, or any use that is inconsistent with the Purpose of this Restrictive Covenant; and

(d) All present and future development rights allocated, implied, reserved or inherent in the Restricted Property; such rights are hereby terminated and extinguished, and may not be used on or transferred to any portion of the Restricted Property, nor any other property adjacent or otherwise; and

(e) The right to enforce by any means, including, without limitation, injunctive relief, the terms and conditions of this Restrictive Covenant.

3. Declarant's Duties. El Dorado Benson, L.L.C., or any successor permittee under the Section 404 Permit which assumes mitigation obligations under the Section 404 Permit, shall undertake construction, maintenance and monitoring of mitigated areas pursuant to the Mitigation Plan until receipt of final approval of the success of the Mitigation Plan from ACOE ("**Final Approval**"). This duty is non-transferrable, except to a successor permittee under the Section 404 Permit. Declarant, its successors and assigns shall:

(a) Undertake all reasonable actions to prevent the unlawful entry and trespass by persons whose activities would be inconsistent with the Conservation Values and would violate the permitted uses of the Restricted Property set forth in this Restrictive Covenant; and

(b) Cooperate with ACOE in the protection of the Conservation Values; and

(c) Repair and restore damage to the Restrictive Property directly or indirectly caused by Declarant, Declarant's guests, representatives or agents and third parties within Declarant's control; provided, however, Declarant, its successors or assigns shall not engage in any repair or restoration work in the Restricted Property without first consulting with ACOE; and

(d) Obtain any applicable governmental permits and approvals for any activity or use permitted by this Restrictive Covenant, and any activity or use shall be undertaken in accordance with all applicable federal, state, local and administrative agency statutes, ordinances, rules, regulations, orders or requirements; and

(e) Upon receipt of Final Approval, perform in-perpetuity Long-Term Maintenance on the Restricted Property set forth in Section 14 below; and

(f) Within 60 days of recordation of this Restrictive Covenant, install signs and other notification features saying "Natural Area Open Space," "Protected Natural Area," or similar descriptions that inform persons of the nature and restrictions on the Restricted Property. Prior to erection of such signage, Declarant shall submit detailed plans showing the location and language of such signs to ACOE for review and approval. The erection and maintenance of informative signage shall not be in direct or potential conflict with the preservation of the Natural Condition of the Restricted Property or the Purpose of this Restrictive Covenant and shall be performed in compliance with all applicable statutes, regulations, and permitting requirements; and

(g) Perform an annual compliance inspection of the Restricted Property, prepare an inspection report, and shall make reports available to ACOE upon request.

4. Prohibited Uses. Any activity on or use of the Restricted Property inconsistent with the Purpose of this Restrictive Covenant is prohibited. Without limiting the generality of the foregoing, the following uses by Declarant, and its respective guests, agents, assigns, employees, representatives, successors and third parties within Declarant's control, are expressly prohibited:

(a) Supplemental or unseasonable watering except as specifically provided for in the Mitigation Plan;

(b) Use of herbicides, pesticides, rodenticides, biocides, fertilizers, or other agricultural chemicals or weed abatement activities, except weed abatement activities necessary to control or remove invasive, exotic plant species;

(c) Incompatible fire protection activities, except the fire prevention activities set forth in Subsection 5(f);

(d) Use of off-road vehicles and use of any other motorized vehicles except on existing roadways and as necessary to restore native plant communities consistent with Section 5;

(e) Grazing or other agricultural activity of any kind;

(f) Recreational activities, including, but not limited to, horseback riding, biking, hunting or fishing;

(g) Residential, commercial, retail, institutional, or industrial uses;

(h) Any legal or de facto division, subdivision or partitioning of the Restricted Property;

(i) Construction, reconstruction or placement of any building, road, wireless communication cell towers, or other improvement, or any billboard, fence, boundary marker or sign, except fences required to comply with Subsection 3(a) and signs permitted in Subsection 3(f);

(j) Depositing, dumping or accumulating soil, trash, ashes, refuse, waste, bio-solids or any other material;

(k) Planting, introduction or dispersal of non-native or exotic plant or animal species;

(l) Filling, dumping, excavating, draining, dredging, mining, drilling, removing or exploring for or extraction of minerals, loam, gravel, soil, rock, sand or other material on or below the surface of the Restricted Property;

(m) Altering the general topography of the Restricted Property, including but not limited to building of roads and trails, and flood control work, except as provided for in the Mitigation Plan;

(n) Removing, destroying, or cutting of trees, shrubs or other vegetation, except as necessary for (1) emergency fire protection as required by fire safety officials as set forth in Subsection 5(f), (2) controlling invasive, exotic plants which threaten the integrity of the habitat, (3) preventing or treating disease, (4) conducting activities permitted by the Mitigation Plan, or (5) activities described in Section 3, Section 5 and Section 14. In the event that activity in the Restricted Property is necessary to prevent or treat disease as listed in item (3) herein, the first priority for action shall be chemical and biological methods. No invasive or non-native species shall be introduced to prevent or treat disease, unless chemical or biological methods have failed to resolve the problem and a Federal, State or local agency with authority determines that no other methods will address the problem. Removal of vegetation to prevent or treat disease shall only be allowed if chemical or biological methods have failed to resolve the problem or upon a showing that removal of vegetation is required on an emergency basis;

(o) Manipulating or altering any natural watercourse, body of water or water circulation on the Restricted Property other than as described in the Mitigation Plan, and activities or uses detrimental to water quality, including but not limited to degradation or pollution of any surface or sub-surface waters;

(p) Creating, enhancing, or maintaining fuel modification zones (defined as a strip of mowed land or the planting of vegetation possessing low combustibility for purposes of fire suppression), or other activities that could constitute fuel modification zones;

(q) Without the prior written consent of ACOE, which ACOE may withhold, transferring, encumbering, selling, leasing, or otherwise separating the mineral, air or water rights from the Restricted Property; changing the place or purpose of use of the water rights on the Restricted Property; abandoning or allowing the abandonment of, by action or inaction, any water or water rights, ditch or ditch rights, spring rights, reservoir or storage rights, wells, ground water rights, or other rights in and to the use of water historically used on or otherwise appurtenant to the Restricted Property, including but not limited to: (1) riparian water rights; (2) appropriative water rights; (3) rights to waters which are secured under contract with any irrigation or water district, to the extent such waters are customarily applied to the Restricted Property; and (4) any

water from wells that are in existence or may be constructed in the future on the Restricted Property;

(r) Engaging in any use or activity that may violate, or may fail to comply with, relevant federal, state, or local laws, regulations, or policies applicable to Declarant, the Restricted Property, or the use or activity in question;

(s) No use shall be made of the Restricted Property, and no activity thereon shall be permitted, that is or is likely to become inconsistent with the Purpose of this Restrictive Covenant. Declarant acknowledges that, in view of the perpetual nature of this Restrictive Covenant, it is unable to foresee all potential future land uses, future technologies, and future evolution of the land and other natural resources, and other future occurrences affecting the Purpose of this Restrictive Covenant. ACOE may determine whether (1) proposed uses or proposed improvements not contemplated by or addressed in this Restrictive Covenant or (2) alterations in existing uses or structures, are consistent with the Purpose of this Restrictive Covenant; and

(t) Creation of any encumbrance superior to this Restrictive Covenant, other than those encumbrances set forth in **Exhibit "C"** hereto, or the recording of any involuntary lien (which is not released within thirty calendar days), or the granting of any lease, license or similar possessory interest in the Restricted Property which will affect the Conservation Values of the Restricted Property.

5. Reserved Rights. Declarant reserves to itself, and to its personal representatives, heirs, successors, and assigns, all rights accruing from its ownership of the Restricted Property, including the right to engage in or to permit or invite others to engage in all uses of the Restricted Property that are not expressly prohibited or limited by, and are consistent with, the Purpose of this Restrictive Covenant, including, but not limited to, the following uses:

(a) Access. Reasonable access through the Restricted Property to adjacent land or to perform obligations or other activities permitted by this Restrictive Covenant or that are required under the Section 404 Permit or Mitigation Plan. In addition, police and other public safety organizations and their personnel may enter the Restricted Property to address any legitimate public health or safety matter. When and if El Dorado Benson, L.L.C. assigns its rights and duties under this Restrictive Covenant to a conservation organization or property owners' association, El Dorado Benson, L.L.C. may not assign to the conservation organization or property owners' association the duty to undertake construction, maintenance and monitoring of mitigated areas pursuant to the Mitigation Plan, i.e., El Dorado Benson, L.L.C. will remain responsible for the Compensatory Mitigation obligations of the Section 404 Permit until Final Approval is obtained. In the event El Dorado Benson, L.L.C. conveys its interest in the Restricted Property prior to completion of Compensatory Mitigation requirements, El Dorado Benson, L.L.C. expressly reserves the right for it or its agents to enter the Restricted Property to perform such work thereon as is required to meet the Compensatory Mitigation obligations of the Section 404 Permit.

(b) Habitat Enhancement Activities. Enhancement of native plant communities, including the right to plant trees and shrubs of the same type as currently exist on the Restricted Property, so long as such activities do not harm the habitat types identified in the Section 404 Permit or Mitigation Plan. For purposes of preventing erosion and reestablishing native vegetation, the Declarant shall have the right to revegetate areas that may be damaged by the permitted activities under this Section 5, naturally occurring events or by the acts of persons wrongfully damaging the Natural Condition of the Restricted Property. Prior to any habitat enhancement activities, Declarant shall have a Biological Monitor submit detailed plans to ACOE for review and approval. Habitat enhancement activities shall not be in direct or potential conflict with the preservation of the Natural Condition of the Restricted Property or the Purpose of this Restrictive Covenant and shall be performed in compliance with all applicable laws, regulations, and permitting requirements.

(c) Vegetation, Debris, and Exotic Species Removal. Removal or trimming of vegetation downed or damaged due to natural disaster, removal of man-made debris, removal of parasitic vegetation (as it relates to the health of the host plant) and removal of non-native or exotic plant or animal species. Vegetation, debris, and exotic plant species removal shall not be in direct or potential conflict with the preservation of the Natural Condition of the Restricted Property or the Purpose of this Restrictive Covenant and shall be performed in compliance with all applicable laws, regulations, and permitting requirements.

(d) Erection and Maintenance of Informative Signage. Erection and maintenance of signage and other notification features saying "No Trespass" or similar descriptions that inform persons of the nature and restrictions on the Restricted Property.

(e) [intentionally deleted]

(f) Fire Protection. The right, in an emergency situation only, to maintain firebreaks (defined as a strip of plowed or cleared land made to check the spread of a fire), trim or remove brush, otherwise perform preventative measures required by the fire department to protect structures and other improvements from encroaching fire. All other brush management activities, activities prohibited by Subsection 4(p), or other fire prevention measures suggested by the fire department, shall be limited to areas outside the Restricted Property.

(g) Mitigation Plan. Notwithstanding anything herein to the contrary, El Dorado Benson, L.L.C., or any assignee of the Section 404 Permit which assumes mitigation obligations under such permit, may take any action required by the Mitigation Plan. Such actions may include, but are not limited to the following: (1) the right to maintain, repair and or replace from time to time any or all of the vegetation planted as part of the Mitigation Plan and (2) actions taken consistent with the Mitigation Plan.

6. Enforcement.

(a) Right to Enforce. Declarant, its successors and assigns, grant to ACOE and the U.S. Department of Justice a discretionary right to enforce these restrictive covenants in a judicial or administrative action against any person(s) or other entity(ies) violating or attempting to violate these restrictive covenants; provided, however, that no violation of these restrictive covenants shall result in a forfeiture or reversion of title. The U.S. Department of Justice shall have the same rights, remedies and limitations as ACOE under this Section 6. The rights under this Section are in addition to, and do not limit rights conferred in Section 2 above, the rights of enforcement against Declarant, its successor or assigns under the Section 404 Permit, or any rights of the various documents created thereunder or referred to therein.

(b) Notice.

(1) If ACOE determines Declarant is in violation of the terms of this Restrictive Covenant or that a violation is threatened, ACOE may demand the cure of such violation. In such a case, ACOE shall issue a written notice to Declarant (hereinafter "**Notice of Violation**") informing Declarant of the violation and demanding cure of such violation.

(2) Declarant shall cure the noticed violation within thirty (30) days of receipt of said written notice from ACOE. If said cure reasonably requires more than thirty (30) days, Declarant shall, within the thirty (30) day period submit to ACOE for review and approval a plan and time schedule to diligently complete a cure. Declarant shall complete such cure in accordance with the approved plan. If Declarant disputes the Notice of Violation, it shall issue a written notice of such dispute (hereinafter "**Notice of Dispute**") to the ACOE within thirty (30) days of receipt of written Notice of Violation.

(3) If Declarant fails to cure the noticed violation(s) within the time period(s) described in Subsection 6(b)(2) above, or Subsection 6(c) below, ACOE may bring an action at law or in equity in a court of competent jurisdiction to enforce compliance by Declarant with the terms of this Restrictive Covenant. In such action, the ACOE may (i) recover any damages to which they may be entitled for violation by Declarant of the terms of this Restrictive Covenant, (ii) enjoin the violation, *ex parte* if necessary, by temporary or permanent injunction without the necessity of proving either actual damages or the inadequacy of otherwise available legal remedies, or (iii) pursue other equitable relief, including, but not limited to, the restoration of the Restricted Property to the condition in which it existed prior to any such violation or injury. ACOE may apply any damages recovered to the cost of undertaking any corrective action on the Restricted Property.

(4) If Declarant provides ACOE with a Notice of Dispute, as provided herein, ACOE shall meet and confer with Declarant at a mutually agreeable place and time, not to exceed thirty (30) days from the date that ACOE receives the Notice of Dispute. ACOE shall consider all relevant information concerning the disputed violation provided by Declarant and shall determine whether a violation has in fact occurred and, if so, whether the Notice of Violation and demand for cure issued by ACOE is appropriate in light of the violation.

(5) If, after reviewing Declarant's Notice of Dispute, conferring with Declarant, and considering all relevant information related to the violation, ACOE determines that a violation has occurred, ACOE shall give Declarant notice of such determination in writing. Upon receipt of such determination, Declarant shall have thirty (30) days to cure the violation. If said cure reasonably requires more than thirty (30) days, Declarant shall, within the thirty (30) day period submit to ACOE for review and approval a plan and time schedule to diligently complete a cure. Declarant shall complete such cure in accordance with the approved plan.

(c) Immediate Action. If ACOE determines that circumstances require immediate action to prevent or mitigate significant damage to the Conservation Values of the Restricted Property, ACOE may immediately pursue all available remedies, including injunctive relief, available pursuant to both this Restrictive Covenant and state and federal law after giving Declarant at least twenty four (24) hours' written notice before pursuing such remedies. So long as such twenty four (24) hours' notice is given, ACOE may immediately pursue all available remedies without waiting for the expiration of the time periods provided for cure or Notice of Dispute as described in Subsection 6(b)(2). The written notice pursuant to this paragraph may be transmitted to Declarant by facsimile. The rights of ACOE under this paragraph apply equally to actual or threatened violations of the terms of this Restrictive Covenant. Declarant agrees that the remedies at law for ACOE for any violation of the terms of this Restrictive Covenant are inadequate and that ACOE shall be entitled to the injunctive relief described in this section, both prohibitive and mandatory, in addition to such other relief to which ACOE may be entitled, including specific performance of the terms of this Restrictive Covenant, without the necessity of proving either actual damages or the inadequacy of otherwise available legal remedies. The remedies described in this Subsection 6(c) shall be cumulative and shall be in addition to all remedies now or hereafter existing at law or in equity.

(d) Costs of Enforcement. Any costs incurred by ACOE, as the prevailing party, in enforcing the terms of this Restrictive Covenant against Declarant including, but not limited to, costs of suit and attorneys' fees, and any costs of restoration necessitated by Declarant's negligence or breach of this Restrictive Covenant shall be borne by Declarant.

(e) Enforcement Discretion. Enforcement of the terms of this Restrictive Covenant shall be at the discretion of ACOE. Any forbearance by ACOE to exercise rights under this Restrictive Covenant in the event of any breach of any term of this Restrictive Covenant by Declarant shall not be deemed or construed to be a waiver by ACOE of such term or of any subsequent breach of the same or any other term of this Restrictive Covenant or of any of the rights of ACOE under this Restrictive Covenant. No delay or omission by ACOE in the exercise of any right or remedy upon any breach by Declarant shall impair such right or remedy or be construed as a waiver. Further, nothing in this Restrictive Covenant creates a non-discretionary duty upon ACOE to enforce its provisions, nor shall deviation from the terms and procedures or failures to enforce its provisions give rise to a private right of action against ACOE by any third party.

(f) Acts Beyond Declarant's Control. Nothing contained in this Restrictive Covenant shall be construed to entitle ACOE to bring any action against Declarant for any injury to or change in the Restricted Property resulting from:

(1) Any natural cause beyond Declarant's control, including without limitation, fire not caused by Declarant, flood, storm, and earth movement; or

(2) Any prudent action taken by Declarant under emergency conditions to prevent, abate, or mitigate significant injury to persons and/or the Restricted Property resulting from such causes, provided that once the emergency has abated, Declarant, its successors or assigns promptly take all reasonable and necessary actions required to restore any damage caused by Declarant's actions to the Restricted Property to the condition it was in immediately prior to the emergency; or

(3) Acts of third parties (including any governmental agencies) that are beyond Declarant's control.

Notwithstanding the foregoing, Declarant must obtain any applicable governmental permits and approvals for any emergency activity or use permitted by this Restrictive Covenant and undertake any activity or use in accordance with all applicable federal, state, local and administrative agency statutes, ordinances, rules, regulations, orders or requirements.

7. Access. This Restrictive Covenant does not convey a general right of access to the public.

8. Costs and Liabilities.

(a) Declarant, or its successor or assign retains all responsibilities and shall bear all costs and liabilities of any kind related to the ownership, operation, upkeep and maintenance of the Restricted Property. Declarant agrees ACOE shall not have any duty or responsibility for the operation, upkeep, or maintenance of the Restricted Property, the monitoring of hazardous conditions thereon, or the protection of Declarant, the public or any third parties from risks relating to conditions on the Restricted Property. Declarant, its successor or assign remains solely responsible for obtaining any applicable governmental permits and approvals for any activity or use permitted by this Restrictive Covenant, and any activity or use shall be undertaken in accordance with all applicable federal, state, local and administrative agency statutes ordinances, rules, regulations, orders and requirements.

(b) Declarant, or its successors and assigns shall hold harmless, protect and indemnify ACOE and its respective directors, officers, employees, agents, contractors, and representatives and the heirs, personal representatives, successors and assigns of each of them (each a "**Third-Party Beneficiary Indemnified Party**" and collectively, "**Third-Party Beneficiary Indemnified Parties**") from and against any and all liabilities, penalties, costs, losses, damages, expenses (including, without limitation reasonable attorneys' fees and experts' fees), causes of

action, claims, demands, orders, liens or judgments (each a "**Claim**" and, collectively, "**Claims**"), arising from or in any way connected with injury to or the death of any person, or physical damage to any property, regardless of cause.

9. Taxes; No Liens. If applicable, Declarant, its successor or assign shall pay before delinquency all taxes, assessments, fees, and charges of whatever description levied on or assessed against the Restricted Property by competent authority, including any taxes imposed upon, or incurred as a result of, this Restrictive Covenant, and agrees to furnish ACOE with satisfactory evidence of payment upon request. Declarant shall keep the Restricted Property free from any liens, including those arising out of any obligations incurred by Declarant or any labor or materials furnished or alleged to have been furnished to or for Declarant at or for use on the Restricted Property.

10. Condemnation. The Purpose of this Restricted Covenant for conservation purposes are presumed to be the best and most necessary public use as defined in Arizona Revised Statutes Section 12-1122 except that Declarant reserves the right to seek fair market value for any condemnation action. Nevertheless, if all or any part of the Restricted Property is taken by exercise of the power of eminent domain, Declarant shall use the net proceeds from the condemnation of the Restricted Property for the purchase of property that replaces the natural resource characteristics the original mitigation was intended to protect, or as near as reasonably feasible. The endowment shall be held for the long-term stewardship of the replacement property. The location of the replacement property and replacement restrictive covenant is subject to prior approval by the ACOE.

11. Assignment and Subsequent Transfers.

(a) Declarant agrees to incorporate the terms of this Restrictive Covenant in any deed or other legal instrument by which Declarant divests itself of any interest in all or a portion of the Restricted Property. Declarant, its successor or assign agrees to (i) incorporate by reference to the title of and the recording information for this Restrictive Covenant in any deed or other legal instrument by which each divests itself of any interest in all or a portion of the Restricted Property, including, without limitation, a leasehold interest and (ii) give actual notice to any such transferee or lessee of the existence of this Restrictive Covenant. Declarant, its successor or assign agrees to give written notice to ACOE of the intent to transfer any interest at least sixty (60) days prior to the date of such transfer. Any subsequent transferee shall be deemed to have assumed the obligations of this Restrictive Covenant and to have accepted the restrictions contained herein. The failure of Declarant, its successor or assign to perform any act provided in this Section shall not impair the validity of this Restrictive Covenant or limit its enforceability in any way.

(b) From and after the date of any transfer of all or any portion of the Restricted Property by Declarant and each transfer thereafter, (i) the transferee shall be deemed to have assumed all of the obligations of Declarant as to the portion transferred, as set forth in this Restrictive Covenant, (ii) the transferee shall be deemed to have accepted the restrictions

contained herein as to the portion transferred, (iii) the transferor, as applicable, shall have no further obligations hereunder, except for the obligations set forth above in Section 3 related to Compensatory Mitigation and Subsection 17(f), and (iv) all references to Declarant in this Restrictive Covenant shall thereafter be deemed to refer to such transferee.

12. Notices. Any notice, demand, request, consent, approval, or communication that either party desires or is required to give to the other shall be in writing and be served personally or sent by first class mail, postage prepaid, addressed as follows:

To Declarant: El Dorado Benson LLC
8501 N. Scottsdale Road. Suite 120
Scottsdale, AZ 85253

With a copy to:

To ACOE: District Counsel
U.S. Army Corps of Engineers
915 Wilshire Blvd, Room 1535
Los Angeles, CA 90017-3401

or to such other address as either party shall designate by written notice to the other. Notice shall be deemed effective upon delivery in the case of personal delivery or, in the case of delivery by first class mail, five (5) days after deposit into the United States mail.

The parties agree to accept facsimile signed documents and agree to rely upon such documents as if they bore original signatures. Each party agrees to provide to the other parties, within seventy-two (72) hours after transmission of such a facsimile, the original documents that bear the original signatures.

If the Restrictive Covenant is assigned, the assignment document shall update the Notices provisions.

When the underlying fee for the Restricted Property is conveyed, the successor shall record a document entitled Restrictive Covenant/Change of Notices Provisions.

13. Amendment. Declarant may amend this Restrictive Covenant only after written concurrence by ACOE. Declarant shall record any amendments to this Restrictive Covenant approved by ACOE in the official records of Cochise County, Arizona, and shall provide a copy of the recorded document to ACOE.

14. Long-Term Maintenance. Upon Final Approval, Declarant, its successors and assigns, shall:

(a) be responsible for in-perpetuity, ongoing, long-term maintenance of the Restricted Property. Such long-term maintenance shall include but shall not be limited to the following activities: (1) no less than annually, removal of trash or manmade debris, preferably by hand or the least impactive method reasonably feasible, (2) annual maintenance of signage and other notification features or similar descriptions, as applicable, installed pursuant to Subsection 3(f).

(b) be responsible for annual restoration of the Restricted Property damaged by any activities prohibited by Subsection 4 (a) - (t) herein.

(c) prepare a monitoring and maintenance report documenting activities performed under Subsection 14(a) above, and shall make reports available to ACOE upon request.

(d) retain a qualified Biological Monitor to prepare a Restoration Plan and to oversee/monitor restoration activities when such activities are performed pursuant to Subsection 14(b) above. Declarant shall have its Biological Monitor submit a draft Restoration Plan to ACOE for review and approval prior to its implementation. Upon completion of restoration as specified in the approved Restoration Plan, Declarant shall have its Biological Monitor prepare a detailed monitoring report, and Declarant shall make the report available to ACOE within thirty (30) days of completion of restoration activities. Declarant and the Biological Monitor shall sign the monitoring report. The report shall document the Biological Monitor's name and affiliation, dates Biological Monitor was present on site, activities observed and their location, Biological Monitor's observations regarding the adequacy of restoration performance by the Declarant, or its contractor in accordance with the approved Restoration Plan, and the corrections recommended and implemented.

15. Recordation. Declarant, its successor or assign shall promptly record this instrument in the official records of Cochise County, Arizona, and provide a copy of the recorded document to ACOE.

16. Estoppel Certificate. Upon request, ACOE shall within fifteen (15) days execute and deliver to Declarant, its successor or assign a letter confirming that (a) this Restrictive Covenant is in full force and effect, and has not been altered, amended, or otherwise modified (except as specifically noted in the letter), (b) there are no pending or threatened enforcement actions against Declarant except as disclosed in the letter, (c) to the knowledge of the ACOE, there are no uncured violations under the Restrictive Covenant, and no facts or circumstances exist that, with the passage of time, could constitute a violation under the Restrictive Covenant, except as disclosed in the letter.

17. General Provisions.

(a) Controlling Law. The laws of the United States and the State of Arizona, disregarding any conflicts of law principles of such state, shall govern the interpretation and performance of this Restrictive Covenant.

(b) Liberal Construction. Any general rule of construction to the contrary notwithstanding, this Restrictive Covenant shall be liberally construed in favor of the deed to effect the Purpose of this Restrictive Covenant. If any provision in this instrument is found to be ambiguous, an interpretation consistent with the Purpose of this Restrictive Covenant that would render the provision valid shall be favored over any interpretation that would render it invalid.

(c) Severability. If a court of competent jurisdiction voids or invalidates on its face any provision of this Restrictive Covenant, such action shall not affect the remainder of this Restrictive Covenant. If a court of competent jurisdiction voids or invalidates the application of any provision of this Restrictive Covenant to a person or circumstance, such action shall not affect the application of the provision to other persons or circumstances.

(d) No Forfeiture. Nothing contained herein will result in a forfeiture or reversion of Declarant's title in any respect.

(e) Successors and Assigns. The covenants, terms, conditions, and restrictions of this Restrictive Covenant shall be binding upon, and inure to the benefit of, the parties hereto and their respective personal representatives, heirs, successors, and assigns and shall continue as a servitude running in perpetuity with the Restricted Property. The covenants hereunder also benefit ACOE, as a third party beneficiary of this Restrictive Covenant.

(f) Termination of Rights and Obligations. Except as otherwise expressly set forth in this Restrictive Covenant and provided the transfer was consistent with the terms of this Restrictive Covenant, a party's rights and obligations under this Restrictive Covenant shall terminate upon transfer of the party's interest in the Restrictive Covenant or Restricted Property (respectively), except that liability for acts or omissions occurring prior to transfer shall survive transfer. However, in those provisions where the term "El Dorado Benson, L.L.C." is used in this Restrictive Covenant, and not the term "Declarant," those provisions shall be called **"Specific Obligations"** and shall apply exclusively to El Dorado Benson, L.L.C. and shall not be transferred to the conservation organization or property owners' association upon conveyance of El Dorado Benson, L.L.C.'s interest in the Restrictive Covenant or Restricted Property. If El Dorado Benson, L.L.C. conveys its interest in the Project to a bona fide purchaser, the Specific Obligations are assumed by such bona fide purchaser by virtue of this Restrictive Covenant.

(g) Captions. The captions in this instrument have been inserted solely for convenience of reference and are not a part of this instrument and shall have no effect upon construction or interpretation.

(h) No Hazardous Materials Liability.

(1) Declarant represents and warrants that to Declarant's actual knowledge there has been no release or threatened release of Hazardous Materials (defined below) or underground storage tanks existing, generated, treated, stored, used, released, disposed of, deposited or abandoned in, on, under, or from the Restricted Property, or transported to or from

or affecting the Restricted Property. Without limiting the obligations of Declarant under Subsection 8(b) herein, Declarant hereby releases and agrees to indemnify, protect and hold harmless the Third Party Beneficiary Indemnified Parties (defined in Subsection 8(b)) against any and all Claims (defined in Subsection 8(b)) arising from or connected with any Hazardous Materials present, or otherwise alleged to be present, on the Restricted Property at any time, except that this release and indemnification shall be inapplicable to the Third Party Beneficiary Indemnified Parties with respect to any Hazardous Materials placed, disposed or released by third party beneficiaries, their employees or agents. This release and indemnification includes, without limitation, Claims for (i) injury to or death of any person or physical damage to any property; and (ii) the violation or alleged violation of, or other failure to comply with, any Environmental Laws (defined below).

(2) Despite any contrary provision of this Restrictive Covenant, the parties do not intend this Restrictive Covenant to be, and this Restrictive Covenant shall not be, construed such that it creates in or gives ACOE any of the following:

(i) The obligations or liabilities of an "owner" or "operator," as those terms are defined and used in Environmental Laws (defined below), including, without limitation, the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended (42 U.S.C. Section 9601 et seq.; hereinafter, "**CERCLA**"); or

(ii) The obligations or liabilities of a person described in 42 U.S.C. Section 9607(a)(3) or (4); or

(iii) The obligations of a responsible person under any applicable Environmental Laws; or

(iv) The right to investigate and remediate any Hazardous Materials associated with the Restricted Property; or

(v) Any control over Declarant's ability to investigate, remove, remediate or otherwise clean up any Hazardous Materials associated with the Restricted Property.

(3) The term "**Hazardous Materials**" includes, without limitation, (i) material that is flammable, explosive or radioactive; (ii) petroleum products, including by-products and fractions thereof; and (iii) hazardous materials, hazardous wastes, hazardous or toxic substances, or related materials defined in CERCLA, the Resource Conservation and Recovery Act (42 U.S.C. Section 6901 et seq.); the Hazardous Materials Transportation Act (49 U.S.C. Section 5101 et seq.); Title 49 of Arizona Revised Statutes, and in the regulations adopted and publications promulgated pursuant to them, or any other applicable federal, state or local laws, ordinances, rules, regulations or orders now in effect or enacted after the date of this Restrictive Covenant.

(4) The term "**Environmental Laws**" includes, without limitation, any federal, state, local or administrative agency statute, ordinance, rule, regulation, order or requirement relating to pollution, protection of human health or safety, the environment or Hazardous Materials. Declarant represents, warrants and covenants to ACOE that activities upon and use of the Restricted Property by Declarant, its agents, employees, invitees and contractors will comply with all Environmental Laws.

(i) Additional Interests. Declarant shall not grant any additional easements, rights of way or other interests in the surface or subsurface of the Restricted Property (other than a security interest that is subordinate to this Restrictive Covenant), or grant or otherwise abandon or relinquish any water rights relating to the Restricted Property, without first obtaining the written consent of ACOE. ACOE may withhold such consent if it determines that the proposed interest or transfer is inconsistent with the Purpose of this Restrictive Covenant or will impair or interfere with the Conservation Values of the Restricted Property. This Section shall not prohibit transfer of a fee or leasehold interest in the Restricted Property that is subject to this Restrictive Covenant and complies with Section 11. Declarant, its successors and assigns shall record any additional easements or other interests in the Restricted Property approved by the ACOE in the official records of Cochise County, Arizona, and provide a copy of the recorded document to the ACOE.

(j) ACOE Benefited Party. Except for Subsection 17(e), the terms of this Restrictive Covenant are for the benefit of the ACOE only and are not for the benefit of any other party.

(k) Extinguishment. If circumstances arise in the future that render the Purpose of the Restrictive Covenant impossible to accomplish, the Restrictive Covenant can only be terminated or extinguished, in whole or in part, by judicial proceedings in a court of competent jurisdiction.

(l) Warranty. Declarant represents and warrants that there are no outstanding mortgages, liens, encumbrances or other interests in the Restricted Property (excepting those shown on Exhibit "C") which have not been expressly subordinated to this Restrictive Covenant, and that the Restricted Property is not subject to any other Conservation Easement.

(m) Change of Conditions. If one or more of the Purpose of this Restrictive Covenant may no longer be accomplished, such failure of purpose shall not be deemed sufficient cause to terminate the entire Restrictive Covenant as long as any other purpose of the Restrictive Covenant may be accomplished. In addition, the inability to carry on any or all of the permitted uses, or the unprofitability of doing so, shall not impair the validity of this Restrictive Covenant or be considered grounds for its termination or extinguishment. Declarant agrees that global warming and climate change-caused effects shall not be a basis for termination of this Restrictive Covenant.

(n) [deleted]

* * * Signatures on following page. * * *

IN WITNESS WHEREOF Declarant has executed this Restrictive Covenant the day and year first above written and agrees to be bound by the terms and provisions hereof.

"**Declarant**"

EL DORADO BENSON, L.L.C.,
an Arizona limited liability company
By: El Dorado Holdings, Inc.,
an Arizona corporation
Its: Administrative Agent

By:_____
Name:_____
Title:_____

[ATTACH NOTARY ACKNOWLEDGEMENT]

EXHIBIT A

Legal Description

EXHIBIT B

The Mitigation Plan

EXHIBIT C

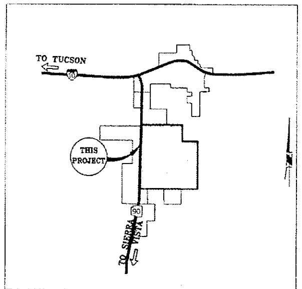
EXHIBIT D

WHETSTONE RANCH

PRESERVATION AREA MAP

APPROXIMATE WATERS OF THE U.S. AND ASSOCIATED BUFFERS TO BE PRESERVED BY RESTRICTIVE COVENANT

SECTION 33 AND A PORTION OF SECTIONS 31 & 32 OF TOWNSHIP 17 SOUTH, RANGE 20 EAST, SECTIONS 3, 4, 5, 8, 9, 10, 15, 16 & 17 AND A PORTION OF SECTIONS 6, 7 & 18 OF TOWNSHIP 18 SOUTH, RANGE 20 EAST OF THE GILA AND SALT RIVER BASE AND MERIDIAN, COCHISE COUNTY, ARIZONA



REGIONAL LOCATION MAP
N.T.S.

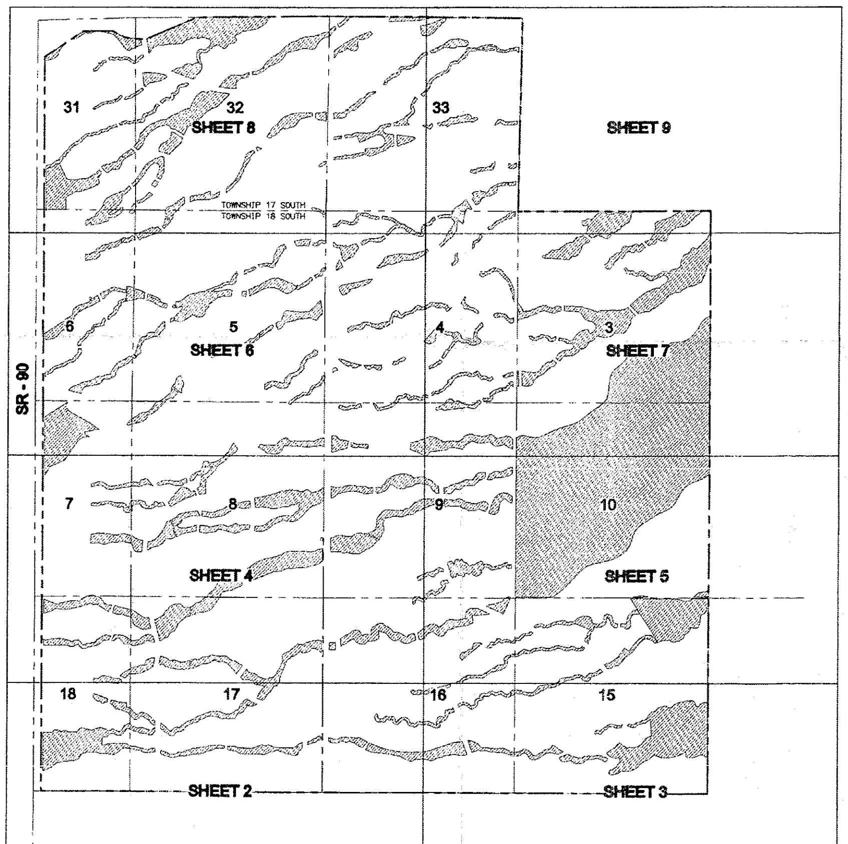
LEGEND

(shaded)	WATERS OF THE U.S. AND ASSOCIATED BUFFER (FOR DETAIL REFER TO USOD PERMIT #2003-00826-SDM)
— — — —	WHETSTONE RANCH PERMIT PROPERTY BOUNDARY
— - —	SECTION LINE
———	SHEET BOUNDARY
10 TOWNSHIP 18 SOUTH RANGE 20 EAST	SECTION NUMBER TOWNSHIP AND RANGE

NOTES

1. THIS MAP DEPICTS THE GENERAL LOCATION OF MITIGATION AREAS LYING WITHIN THE WHETSTONE RANCH PERMIT PROPERTY BENEFICIALLY OWNED BY PERMITTEE WHETSTONE PARTNERS, L.L.P., WHICH MITIGATION AREAS ARE REQUIRED TO BE SUBJECTED TO A RESTRICTIVE COVENANT FOR PRESERVATION UNDER THE SCHEDULE AND TERMS SET FORTH IN THE US ARMY CORPS OF ENGINEERS SECTION 404 PERMIT NUMBER 2003-00826-SDM (THE PERMIT). THE LOCATIONS OF THE MITIGATION AREAS ARE MORE PARTICULARLY DESCRIBED ON THE HABITAT MITIGATION AND MONITORING PLAN ATTACHED TO THE PERMIT AND WILL BE FURTHER DEFINED BY SURVEY. THIS MAP NOTIFIES FUTURE LANDOWNERS OF THE MITIGATION AREAS OF THE REQUIREMENT TO RECORD THE RESTRICTIVE COVENANT. THIS MAP EFFECTS ONLY THE MITIGATION AREAS SHOWN IN THE HABITAT MITIGATION AND MONITORING PLAN ATTACHED TO THE PERMIT AND NOT ANY SURROUNDING PROPERTY. UPON RECORDATION OF THE RESTRICTIVE COVENANT CONTAINING LEGAL DESCRIPTION(S) OF ALL OR ANY PORTION OF THE MITIGATION AREA SHOWN ON THIS MAP, THIS MAP SHALL NO LONGER ENCUMBER OR BURDEN TITLE TO THAT PORTION OF THE MITIGATION AREA DESCRIBED BY SAID LEGAL DESCRIPTION(S). FURTHER, UPON RECORDATION OF A MAP OR PLAT CREATING TRACTS OR SUBOIVIVED LOTS, THIS MAP SHALL NO LONGER ENCUMBER OR BURDEN TITLE TO THE PROPERTY DESCRIBED ON SUCH MAP OR PLAT.
2. IMPACT AREAS SHOWN HEREIN ARE APPROXIMATE AND CHANGES TO THEIR LOCATION ON A GIVEN WATER COURSE MAY BE MADE BY PERMITTEE
3. WATERS OF THE U.S. AND ASSOCIATED BUFFERS, SHOWN HEREON, ARE APPROXIMATE AND WILL BE ACCURATELY LOCATED BY SURVEY BEFORE RESTRICTIVE COVENANTS ARE RECORDED.
4. THIS RECORDING IS FOR THE PURPOSE OF SATISFYING SPECIAL CONDITION (C) OF THE U.S. ARMY CORP OF ENGINEERS SECTION 404 PERMIT NUMBER 2003-00826-SDM.

STATE OF ARIZONA
COUNTY OF COCHISE } SS
This plat was filed ... at the request of
Pioneer Title Aug 21, 2006
Book 33 ... Pages 6-6 M ... thereon
Christine ... Recorder
By: Christine Rhodes
Fee: 0608 31384



SHEET INDEX

1500 0 1500 3000 4500
GRAPHIC SCALE

CONSENT TO RECORD

OWNER:
LAWYERS TITLE AGENCY OF ARIZONA, LLC, AN ARIZONA LIMITED LIABILITY COMPANY, AS TRUSTEE OF TRUST NO. 18083, AND NOT IN ITS CORPORATE CAPACITY

BY: Joyce M Hadda ITS: TRUST OFFICER

BENEFICIAL OWNER/PERMITTEE:
WHETSTONE PARTNERS, L.L.P., AN ARIZONA LIMITED LIABILITY PARTNERSHIP

BY: Ernest L Graves ITS: Manager.

STATE OF ARIZONA
COUNTY OF PIMA } SS

ON THIS, THE 17 DAY OF AUGUST, 2006, BEFORE ME THE UNDERSIGNED NOTARY PUBLIC, PERSONALLY APPEARED Joyce M Hadda WHO ACKNOWLEDGED HIMSELF TO BE THE TRUST OFFICER OF LAWYERS TITLE AGENCY OF ARIZONA, LLC, AN ARIZONA LIMITED LIABILITY COMPANY, AS TRUSTEE OF TRUST NO. 18083, AND NOT IN ITS CORPORATE CAPACITY, AS OWNER, ACKNOWLEDGED THAT HE AS SUCH OFFICER, BEING AUTHORIZED TO DO SO, EXECUTED THE FOREGOING INSTRUMENT ON BEHALF OF FOR THE PURPOSES HEREIN CONTAINED.

IN WITNESS WHEREOF: I HEREUNTO SET MY HAND AND OFFICIAL SEAL.

MY COMMISSION EXPIRES:

OFFICIAL SEAL
MICHELLE REED
NOTARY PUBLIC-ARIZONA
PIMA COUNTY
My Comm. Exp. Nov. 4, 2009

Michelle Reed
NOTARY PUBLIC

STATE OF ARIZONA
COUNTY OF PIMA } SS

ON THIS, THE 17 DAY OF August, 2006, BEFORE ME THE UNDERSIGNED NOTARY PUBLIC, PERSONALLY APPEARED ERNEST L. GRAVES WHO ACKNOWLEDGED HIMSELF TO BE THE MANAGER OF WHETSTONE PARTNERS, L.L.P., AN ARIZONA LIMITED LIABILITY PARTNERSHIP, AS OWNER/PERMITTEE, ACKNOWLEDGED THAT HE AS SUCH OFFICER, BEING AUTHORIZED TO DO SO, EXECUTED THE FOREGOING INSTRUMENT ON BEHALF OF FOR THE PURPOSES HEREIN CONTAINED.

IN WITNESS WHEREOF: I HEREUNTO SET MY HAND AND OFFICIAL SEAL,

MY COMMISSION EXPIRES: March [redacted] 2009

Gayle Schlagel
NOTARY PUBLIC

OFFICIAL SEAL
GAYLE SCHLAGEL
NOTARY PUBLIC-ARIZONA
PIMA COUNTY
My Comm. Exp. March 25, 2009

RBF CONSULTING
PLANNING ■ DESIGN ■ CONSTRUCTION

WHETSTONE RANCH
PRESERVATION AREA MAP
APPROXIMATE WATERS OF THE U.S. AND ASSOCIATED BUFFERS TO BE PRESERVED BY RESTRICTIVE COVENANT

SCALE 1"=1500'
REVISIONS
ORIGINAL PLAN DATE AUG/2006
SHEET NUMBER 1 of 9
PROJECT NUMBER 45102686

Survey Fee #06083/384 BK 33 PG 6

LEGEND

- WATERS OF THE U.S. AND ASSOCIATED BUFFER (FOR DETAIL REFER TO USOD PERMIT #2003-00826-SDM)
- WHETSTONE RANCH PERMIT PROPERTY BOUNDARY
- SECTION LINE
- 10 / TOWNSHIP 18 SOUTH RANGE 20 EAST — SECTION NUMBER, TOWNSHIP AND RANGE

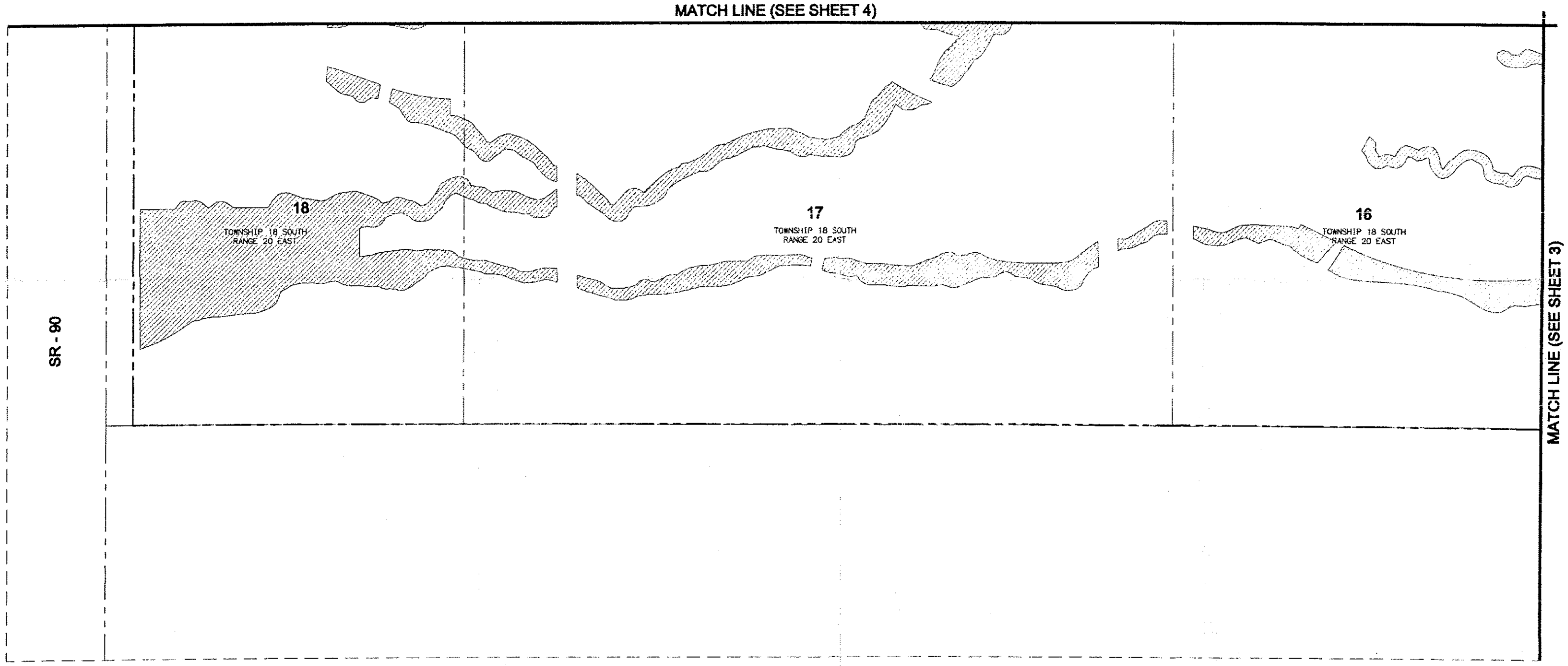
NOTES

1. THIS MAP DEPICTS THE GENERAL LOCATION OF MITIGATION AREAS LYING WITHIN THE WHETSTONE RANCH PERMIT PROPERTY BENEFICIALLY OWNED BY PERMITTEE WHETSTONE PARTNERS, L.L.P., WHICH MITIGATION AREAS ARE REQUIRED TO BE SUBJECTED TO A RESTRICTIVE COVENANT FOR PRESERVATION UNDER THE SCHEDULE AND TERMS SET FORTH IN THE US ARMY CORPS OF ENGINEERS SECTION 404 PERMIT NUMBER 2003-00826-SDM (THE PERMIT). THE LOCATIONS OF THE MITIGATION AREAS ARE MORE PARTICULARLY DESCRIBED ON THE HABITAT MITIGATION AND MONITORING PLAN ATTACHED TO THE PERMIT AND WILL BE FURTHER DEFINED BY SURVEY. THIS MAP NOTIFIES FUTURE LANDOWNERS OF THE MITIGATION AREAS OF THE REQUIREMENT TO RECORD THE RESTRICTIVE COVENANT. THIS MAP EFFECTS ONLY THE MITIGATION AREAS SHOWN IN THE HABITAT MITIGATION AND MONITORING PLAN ATTACHED TO THE PERMIT AND NOT ANY SURROUNDING PROPERTY. UPON RECORDATION OF THE RESTRICTIVE COVENANT CONTAINING LEGAL DESCRIPTION(S) OF ALL OR ANY PORTION OF THE MITIGATION AREA SHOWN ON THIS MAP, THIS MAP SHALL NO LONGER ENCUMBER OR BURDEN TITLE TO THAT PORTION OF THE MITIGATION AREA DESCRIBED BY SAID LEGAL DESCRIPTION(S). FURTHER, UPON RECORDATION OF A MAP OR PLAT CREATING TRACTS OR SUBDIVIVED LOTS, THIS MAP SHALL NO LONGER ENCUMBER OR BURDEN TITLE TO THE PROPERTY DESCRIBED ON SUCH MAP OR PLAT.
2. IMPACT AREAS SHOWN HEREIN ARE APPROXIMATE AND CHANGES TO THEIR LOCATION ON A GIVEN WATER COURSE MAY BE MADE BY PERMITTEE
3. WATERS OF THE U.S. AND ASSOCIATED BUFFERS, SHOWN HEREON, ARE APPROXIMATE AND WILL BE ACCURATELY LOCATED BY SURVEY BEFORE RESTRICTIVE COVENANTS ARE RECORDED
4. THIS RECORDING IS FOR THE PURPOSE OF SATISFYING SPECIAL CONDITION (C) OF THE U.S. ARMY CORP OF ENGINEERS SECTION 404 PERMIT NUMBER 2003-00826-SDM.

SCALE: 1"=400'

400 0 400 800 1200
GRAPHIC SCALE

MATCH LINE (SEE SHEET 4)



MATCH LINE (SEE SHEET 3)

NO.	BY	DESCRIPTION	APP'D	DATE

REVISIONS

RBF CONSULTING
PLANNING ■ DESIGN ■ CONSTRUCTION
16605 NORTH 28th AVENUE, SUITE 100
PHOENIX, ARIZONA 85053-7550
602.467.2200 • FAX 602.467.2201 • www.RBF.com

DESIGN/LAYOUT	DRAFTED	CHECKED	MANAGING ENGINEER/SURVEYOR
SHM	AP	SHM	SAMUEL H. MILLS, P.E., R.L.S.
DRAWING SCALE: 1"=400'			PROJECT COORDINATOR: SAMUEL H. MILLS, P.E., R.L.S.

WHETSTONE RANCH

PRESERVATION AREA MAP
APPROXIMATE WATERS OF THE U.S. AND ASSOCIATED BUFFERS TO BE PRESERVED BY RESTRICTIVE COVENANT

ORIGINAL PLAN DATE: AUG/2006
LATEST PLAN REVISION: -
SHEET NUMBER: 2 of 9
PROJECT NUMBER: 45102686

Survey Fee # 060831384

BK 33 PG 6A

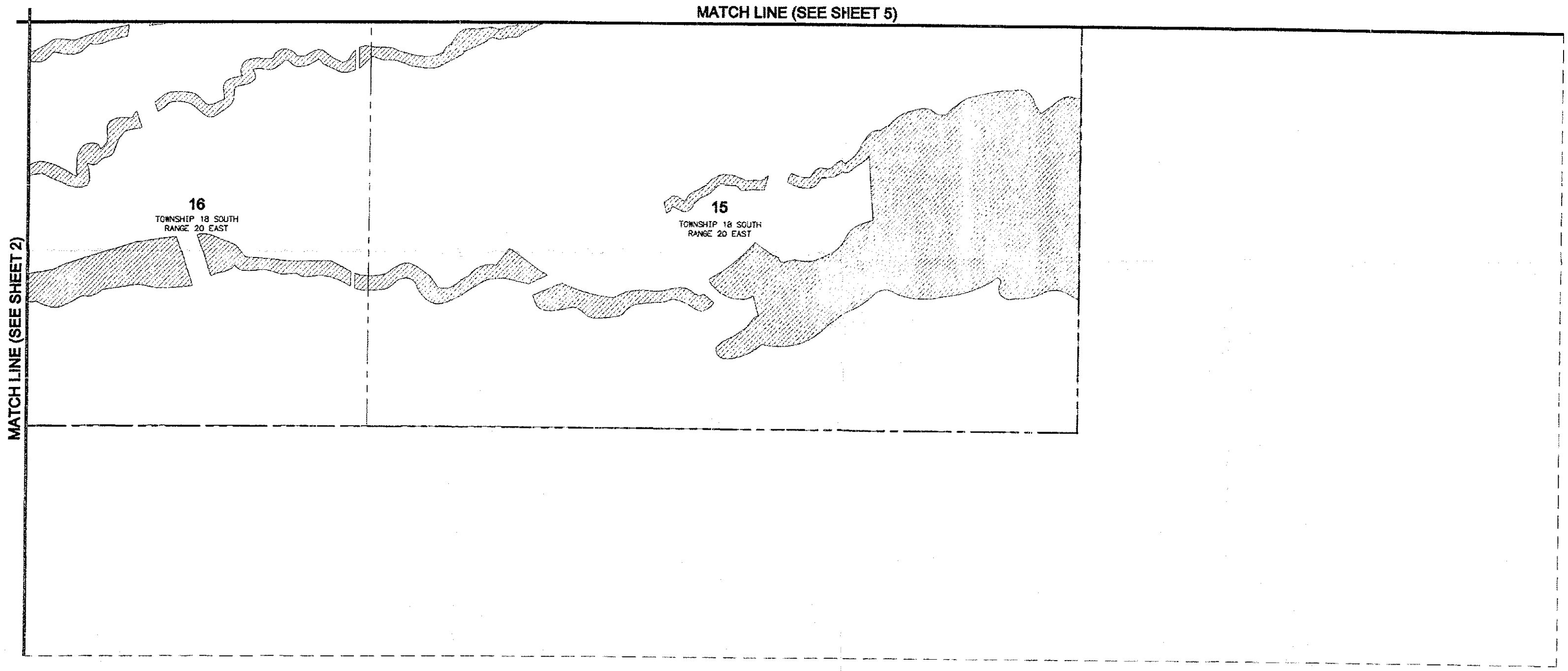
LEGEND

(shaded box)	WATERS OF THE U.S. AND ASSOCIATED BUFFER (FOR DETAIL REFER TO USOD PERMIT #2003-00826-SDM)
— — — —	WHETSTONE RANCH PERMIT PROPERTY BOUNDARY
— — — —	SECTION LINE
10 TOWNSHIP 18 SOUTH RANGE 20 EAST	SECTION NUMBER TOWNSHIP AND RANGE

NOTES

1. THIS MAP DEPICTS THE GENERAL LOCATION OF MITIGATION AREAS LYING WITHIN THE WHETSTONE RANCH PERMIT PROPERTY BENEFICIALLY OWNED BY PERMITTEE WHETSTONE PARTNERS, L.L.P., WHICH MITIGATION AREAS ARE REQUIRED TO BE SUBJECTED TO A RESTRICTIVE COVENANT FOR PRESERVATION UNDER THE SCHEDULE AND TERMS SET FORTH IN THE US ARMY CORPS OF ENGINEERS SECTION 404 PERMIT NUMBER 2003-00826-SDM (THE PERMIT). THE LOCATIONS OF THE MITIGATION AREAS ARE MORE PARTICULARLY DESCRIBED ON THE HABITAT MITIGATION AND MONITORING PLAN ATTACHED TO THE PERMIT AND WILL BE FURTHER DEFINED BY SURVEY. THIS MAP NOTIFIES FUTURE LANDOWNERS OF THE MITIGATION AREAS OF THE REQUIREMENT TO RECORD THE RESTRICTIVE COVENANT. THIS MAP EFFECTS ONLY THE MITIGATION AREAS SHOWN IN THE HABITAT MITIGATION AND MONITORING PLAN ATTACHED TO THE PERMIT AND NOT ANY SURROUNDING PROPERTY. UPON RECORDATION OF THE RESTRICTIVE COVENANT CONTAINING LEGAL DESCRIPTION(S) OF ALL OR ANY PORTION OF THE MITIGATION AREA SHOWN ON THIS MAP, THIS MAP SHALL NO LONGER ENCUMBER OR BURDEN TITLE TO THAT PORTION OF THE MITIGATION AREA DESCRIBED BY SAID LEGAL DESCRIPTION(S). FURTHER UPON RECORDATION OF A MAP OR PLAT CREATING TRACTS OR SUBDIVIVED LOTS. THIS MAP SHALL NO LONGER ENCUMBER OR BURDEN TITLE TO THE PROPERTY DESCRIBED ON SUCH MAP OR PLAT.
2. IMPACT AREAS SHOWN HEREIN ARE APPROXIMATE AND CHANGES TO THEIR LOCATION ON A GIVEN WATER COURSE MAY BE MADE BY PERMITTEE.
3. WATERS OF THE U.S. AND ASSOCIATED BUFFERS, SHOWN HEREON, ARE APPROXIMATE AND WILL BE ACCURATELY LOCATED BY SURVEY BEFORE RESTRICTIVE COVENANTS ARE RECORDED.
4. THIS RECORDING IS FOR THE PURPOSE OF SATISFYING SPECIAL CONDITION (C) OF THE U.S. ARMY CORP OF ENGINEERS SECTION 404 PERMIT NUMBER 2003-00826-SDM.

400 0 400 800 1200
GRAPHIC SCALE



RBF CONSULTING

REVISIONS

WHETSTONE RANCH
PRESERVATION AREA MAP
APPROXIMATE WATERS OF THE U.S. AND ASSOCIATED BUFFERS TO BE PRESERVED BY RESTRICTIVE COVENANT

ORIGINAL PLAN DATE: AUG/2006

SHEET NUMBER: 3 of 9

PROJECT NUMBER: 45102686

Survey Fee #060831384

BK 33 PG 6 B

LEGEND

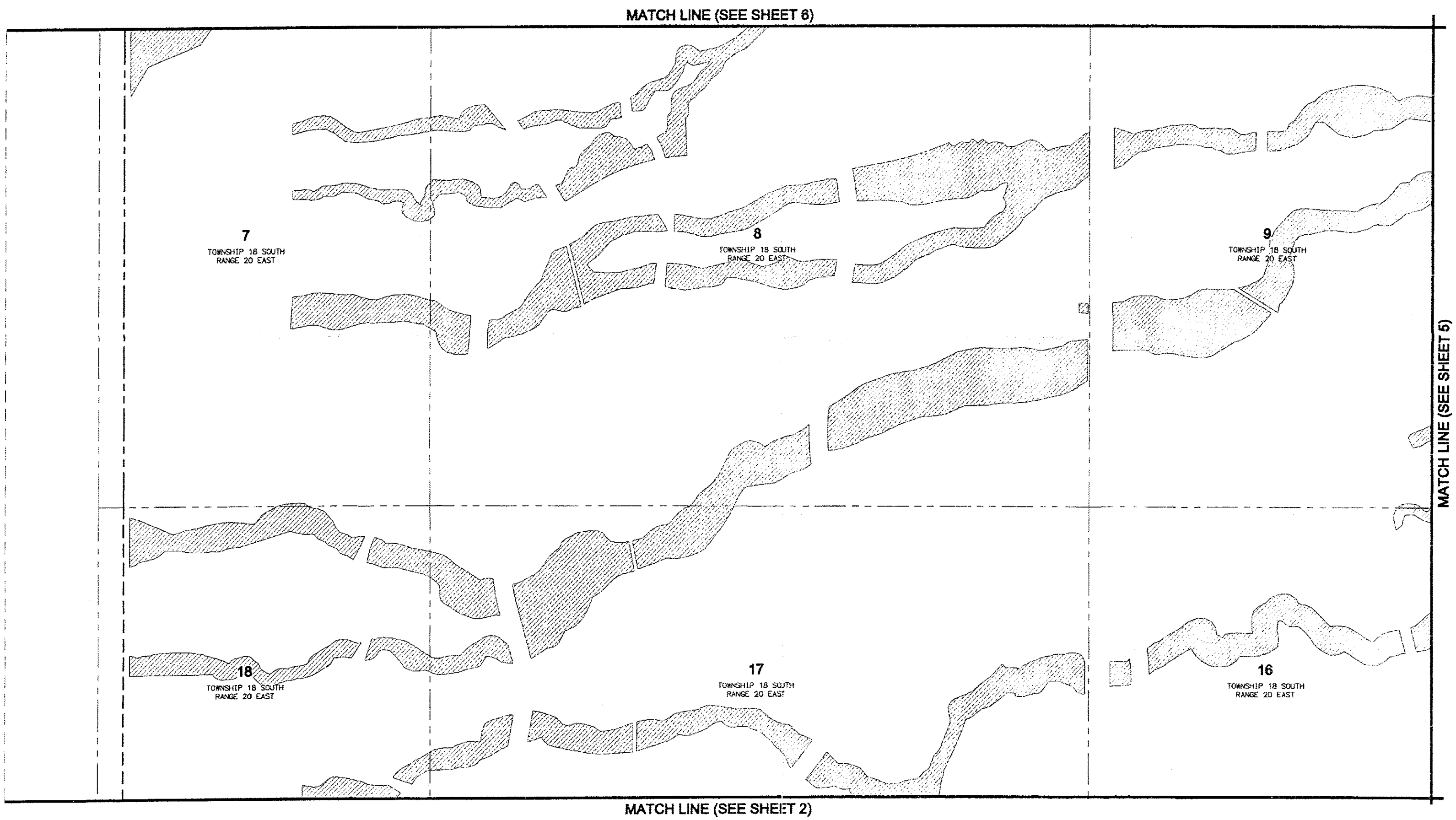
[shaded pattern]	WATERS OF THE U.S. AND ASSOCIATED BUFFER (FOR DETAIL REFER TO USDD PERMIT #2003-00826-SDM)
— — — —	WHETSTONE RANCH PERMIT PROPERTY BOUNDARY
— — — —	SECTION LINE
10 TOWNSHIP 18 SOUTH RANGE 20 EAST	SECTION NUMBER. TOWNSHIP AND RANGE

NOTES

1. THIS MAP DEPICTS THE GENERAL LOCATION OF MITIGATION AREAS LYING WITHIN THE WHETSTONE RANCH PERMIT PROPERTY BENEFICIALLY OWNED BY PERMITIEE WHETSTONE PARTNERS, L.L.P., WHICH MITIGATION AREAS ARE REQUIRED TO BE SUBJECTED TO A RESTRICTIVE COVENANT FOR PRESERVATION UNDER THE SCHEDULE AND TERMS SET FORTH IN THE US ARMY CORPS OF ENGINEERS SECTION 404 PERMIT NUMBER 2003-00826-SDM (THE PERMIT). THE LOCATIONS OF THE MITIGATION AREAS ARE MORE PARTICULARLY DESCRIBED ON THE HABITAT MITIGATION AND MONITORING PLAN ATTACHED TO THE PERMIT AND WILL BE FURTHER DEFINED BY SURVEY. THIS MAP NOTIFIES FUTURE LANDOWNERS OF THE MITIGATION AREAS OF THE REQUIREMENT TO RECORD THE RESTRICTIVE COVENANT. THIS MAP EFFECTS ONLY THE MITIGATION AREAS SHOWN IN THE HABITAT MITIGATION AND MONITORING PLAN ATTACHED TO THE PERMIT AND NOT ANY SURROUNDING PROPERTY. UPON RECORDATION OF THE RESTRICTIVE COVENANT CONTAINING LEGAL DESCRIPTION(S) OF ALL OR ANY PORTION OF THE MITIGATION AREA SHOWN ON THIS MAP, THIS MAP SHALL NO LONGER ENCUMBER OR BURDEN TITLE TO THAT PORTION OF THE MITIGATION AREA DESCRIBED BY SAID LEGAL DESCRIPTION(S). FURTHER UPON RECORDATION OF A MAP OR PLAT CREATING TRACTS OR SUBDIVIVED LOTS. THIS MAP SHALL NO LONGER ENCUMBER OR BURDEN TITLE TO THE PROPERTY DESCRIBED ON SUCH MAP OR PLAT
2. IMPACT AREAS SHOWN HEREIN ARE APPROXIMATE AND CHANGES TO THEIR LOCATION ON A GIVEN WATER COURSE MAY BE MADE BY PERMITTEE.
3. WATERS OF THE U.S. AND ASSOCIATED BUFFERS, SHOWN HEREON, ARE APPROXIMATE AND WILL BE ACCURATELY LOCATED BY SURVEY BEFORE RESTRICTIVE COVENANTS ARE RECORDED
4. THIS RECORDING IS FOR THE PURPOSE OF SATISFYING SPECIAL CONDITION (C) OF THE U.S. ARMY CORP OF ENGINEERS SECTION 404 PERMIT NUMBER 2003-00826-SDM

SCALE: 1"=400'

400 0 400 800 1200
GRAPHIC SCALE



WHETSTONE RANCH
PRESERVATION AREA MAP
APPROXIMATE WATERS OF THE U.S. AND ASSOCIATED BUFFERS TO BE PRESERVED BY RESTRICTIVE COVENANT

NO.	BY	DESCRIPTION	APP'D	DATE
		REVISIONS		

RBF CONSULTING
PLANNING ■ DESIGN ■ CONSTRUCTION
16605 NORTH 28th AVENUE, SUITE 100
PHOENIX, ARIZONA 85053-7550
602.467.2200 • FAX 602.467.2201 • www.RBF.com

DESIGN/LAYOUT	DRAFTED	CHECKED	MANAGING ENGINEER/SURVEYOR
SHM	AP	SHM	SAMUEL H. MILLS, P.E., R.L.S.
DRAWING SCALE 1"=400'			PROJECT COORDINATION SAMUEL H. MILLS, P.E., R.L.S.

ORIGINAL PLAN DATE AUG/2006
LATEST PLAN REVISION -
SHEET NUMBER 4 of 9
PROJECT NUMBER 45102686

Survey Fee #060831384 BK33 PG 6C

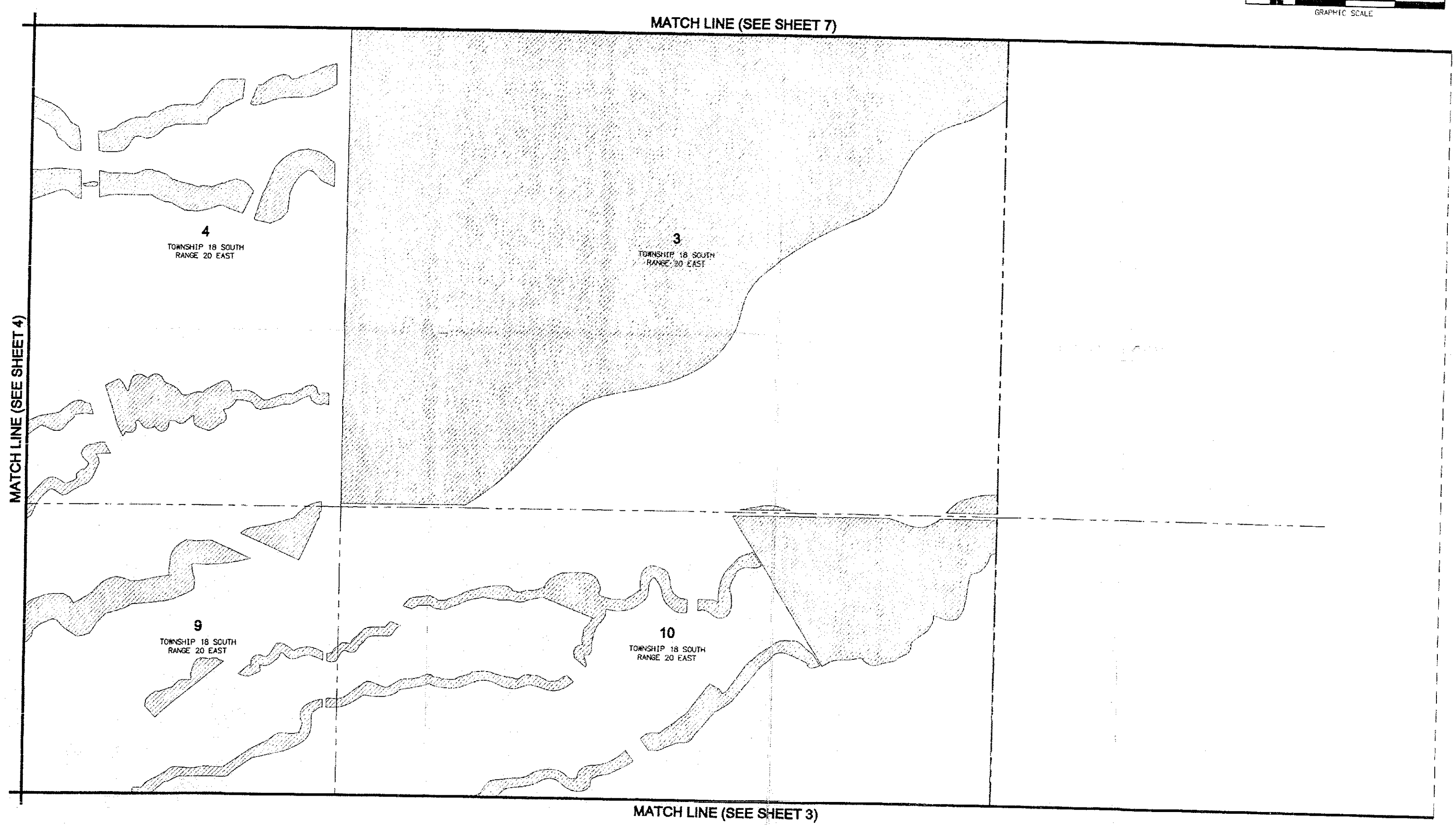
LEGEND

- WATERS OF THE U.S. AND ASSOCIATED BUFFER (FOR DETAIL REFER TO USCO PERMIT #2003-00826-SDM)
- WHETSTONE RANCH PERMIT PROPERTY BOUNDARY
- SECTION LINE
- 10 / TOWNSHIP 18 SOUTH / RANGE 20 EAST — SECTION NUMBER, TOWNSHIP AND RANGE

NOTES

1. THIS MAP DEPICTS THE GENERAL LOCATION OF MITIGATION AREAS LYING WITHIN THE WHETSTONE RANCH PERMIT PROPERTY BENEFICIALLY OWNED BY PERMITTEE WHETSTONE PARTNERS, L.L.P., WHICH MITIGATION AREAS ARE REQUIRED TO BE SUBJECTED TO A RESTRICTIVE COVENANT FOR PRESERVATION UNDER THE SCHEDULE AND TERMS SET FORTH IN THE US ARMY CORPS OF ENGINEERS SECTION 404 PERMIT NUMBER 2003-00826-SDM (THE PERMIT). THE LOCATIONS OF THE MITIGATION AREAS ARE MORE PARTICULARLY DESCRIBED ON THE HABITAT MITIGATION AND MONITORING PLAN ATTACHED TO THE PERMIT AND WILL BE FURTHER DEFINED BY SURVEY. THIS MAP NOTIFIES FUTURE LANDOWNERS OF THE MITIGATION AREAS OF THE REQUIREMENT TO RECORD THE RESTRICTIVE COVENANT. THIS MAP EFFECTS ONLY THE MITIGATION AREAS SHOWN IN THE HABITAT MITIGATION AND MONITORING PLAN ATTACHED TO THE PERMIT AND NOT ANY SURROUNDING PROPERTY. UPON RECORDATION OF THE RESTRICTIVE COVENANT CONTAINING LEGAL DESCRIPTION(S) OF ALL OR ANY PORTION OF THE MITIGATION AREA SHOWN ON THIS MAP, THIS MAP SHALL NO LONGER ENCUMBER OR BURDEN TITLE TO THAT PORTION OF THE MITIGATION AREA DESCRIBED BY SAID LEGAL DESCRIPTION(S). FURTHER, UPON RECORDATION OF A MAP OR PLAT CREATING TRACTS OR SUBDIVIVED LOTS, THIS MAP SHALL NO LONGER ENCUMBER OR BURDEN TITLE TO THE PROPERTY DESCRIBED ON SUCH MAP OR PLAT
2. IMPACT AREAS SHOWN HEREIN ARE APPROXIMATE AND CHANGES TO THEIR LOCATION ON A GIVEN WATER COURSE MAY BE MADE BY PERMITTEE
3. WATERS OF THE U.S. AND ASSOCIATED BUFFERS, SHOWN HEREON, ARE APPROXIMATE AND WILL BE ACCURATELY LOCATED BY SURVEY BEFORE RESTRICTIVE COVENANTS ARE RECORDED.
4. THIS RECORDING IS FOR THE PURPOSE OF SATISFYING SPECIAL CONDITION (C) OF THE U.S. ARMY CORP OF ENGINEERS SECTION 404 PERMIT NUMBER 2003-00826-SDM

GRAPHIC SCALE: 400 0 400 800 1200



RBF CONSULTING — PLANNING ■ DESIGN ■ CONSTRUCTION

REVISIONS

WHETSTONE RANCH

PRESERVATION AREA MAP

APPROXIMATE WATERS OF THE U.S. AND ASSOCIATED BUFFERS TO BE PRESERVED BY RESTRICTIVE COVENANT

ORIGINAL PLAN DATE: AUG/2006

SHEET NUMBER: 5 of 9

PROJECT NUMBER: 45102686

Survey Fee #060831384

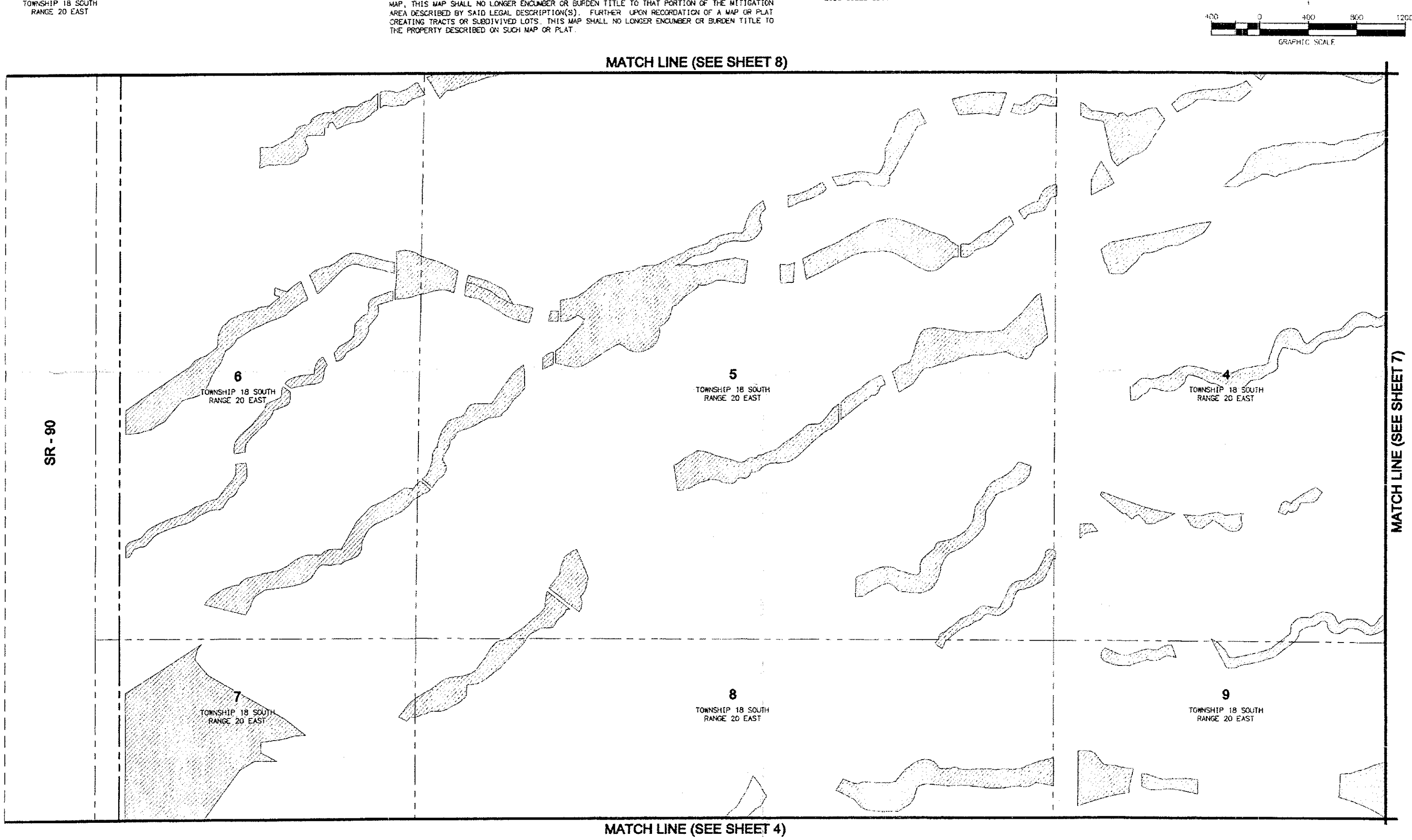
BK33 PG 6D

LEGEND

- WATERS OF THE U.S. AND ASSOCIATED BUFFER (FOR DETAIL REFER TO USOD PERMIT #2003-00826-SDM)
- WHETSTONE RANCH PERMIT PROPERTY BOUNDARY
- SECTION LINE
- 10 TOWNSHIP 18 SOUTH RANGE 20 EAST — SECTION NUMBER, TOWNSHIP AND RANGE

NOTES

1. THIS MAP DEPICTS THE GENERAL LOCATION OF MITIGATION AREAS LYING WITHIN THE WHETSTONE RANCH PERMIT PROPERTY BENEFICIALLY OWNED BY PERMITTEE WHETSTONE PARTNERS, L.L.P., WHICH MITIGATION AREAS ARE REQUIRED TO BE SUBJECTED TO A RESTRICTIVE COVENANT FOR PRESERVATION UNDER THE SCHEDULE AND TERMS SET FORTH IN THE US ARMY CORPS OF ENGINEERS SECTION 404 PERMIT NUMBER 2003-00826-SDM (THE PERMIT). THE LOCATIONS OF THE MITIGATION AREAS ARE MORE PARTICULARLY DESCRIBED ON THE HABITAT MITIGATION AND MONITORING PLAN ATTACHED TO THE PERMIT AND WILL BE FURTHER DEFINED BY SURVEY. THIS MAP NOTIFIES FUTURE LANDOWNERS OF THE MITIGATION AREAS OF THE REQUIREMENT TO RECORD THE RESTRICTIVE COVENANT. THIS MAP EFFECTS ONLY THE MITIGATION AREAS SHOWN IN THE HABITAT MITIGATION AND MONITORING PLAN ATTACHED TO THE PERMIT AND NOT ANY SURROUNDING PROPERTY. UPON RECORDATION OF THE RESTRICTIVE COVENANT CONTAINING LEGAL DESCRIPTION(S) OF ALL OR ANY PORTION OF THE MITIGATION AREA SHOWN ON THIS MAP, THIS MAP SHALL NO LONGER ENCUMBER OR BURDEN TITLE TO THAT PORTION OF THE MITIGATION AREA DESCRIBED BY SAID LEGAL DESCRIPTION(S). FURTHER UPON RECORDATION OF A MAP OR PLAT CREATING TRACTS OR SUBDIVIVED LOTS, THIS MAP SHALL NO LONGER ENCUMBER OR BURDEN TITLE TO THE PROPERTY DESCRIBED ON SUCH MAP OR PLAT.
2. IMPACT AREAS SHOWN HEREIN ARE APPROXIMATE AND CHANGES TO THEIR LOCATION ON A GIVEN WATER COURSE MAY BE MADE BY PERMITTEE.
3. WATERS OF THE U.S. AND ASSOCIATED BUFFERS, SHOWN HEREON, ARE APPROXIMATE AND WILL BE ACCURATELY LOCATED BY SURVEY BEFORE RESTRICTIVE COVENANTS ARE RECORDED
4. THIS RECORDING IS FOR THE PURPOSE OF SATISFYING SPECIAL CONDITION (C) OF THE U.S. ARMY CORP OF ENGINEERS SECTION 404 PERMIT NUMBER 2003-00826-SDM.



WHETSTONE RANCH

PRESERVATION AREA MAP

APPROXIMATE WATERS OF THE U.S. AND ASSOCIATED BUFFERS TO BE PRESERVED BY RESTRICTIVE COVENANT

RBF CONSULTING

ORIGINAL PLAN DATE: AUG/2006

SHEET NUMBER: 6 of 9

PROJECT NUMBER: 45102686

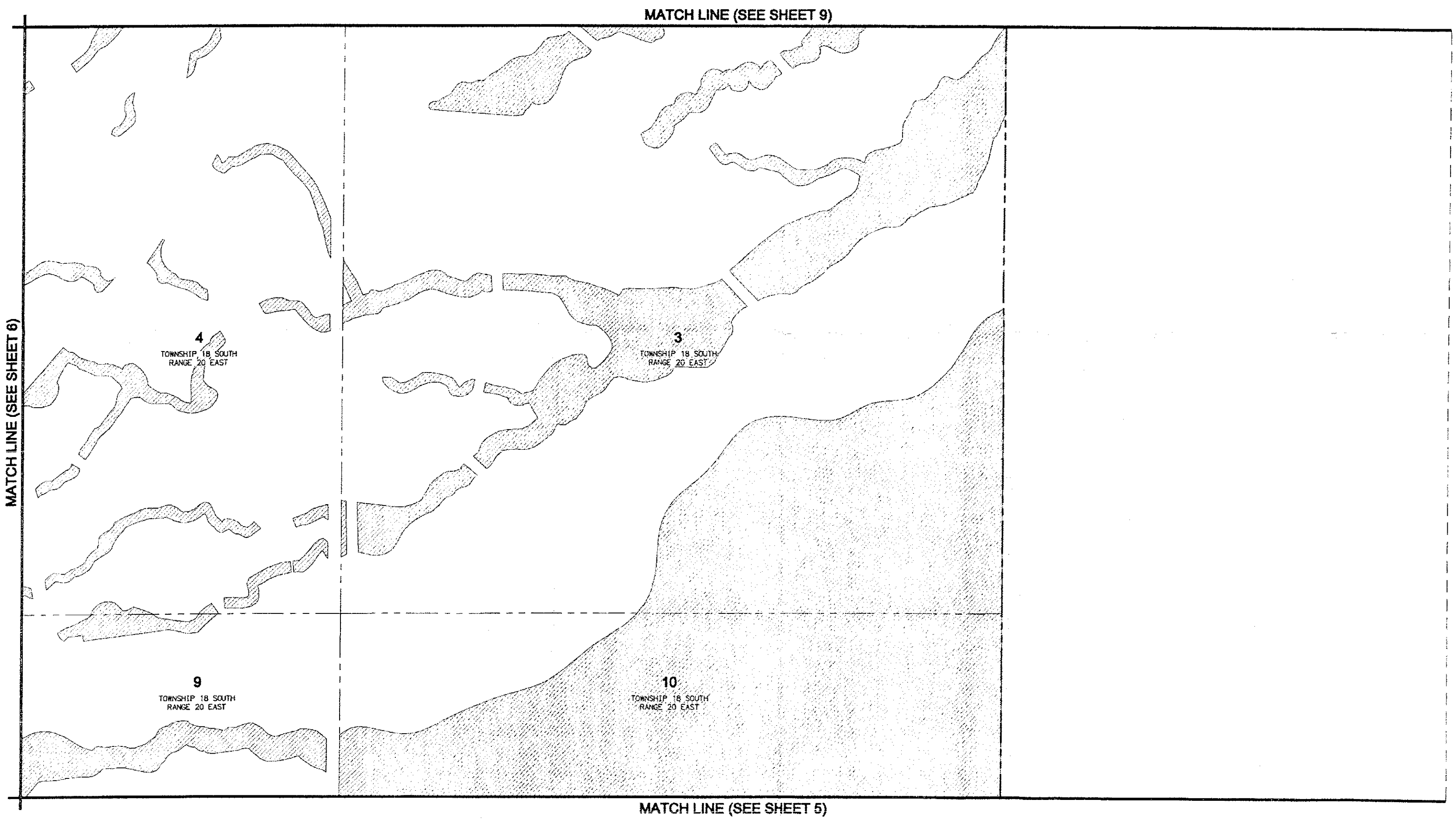
Survey Fee #060831384 BK 33 PG 6E

LEGEND

- WATERS OF THE U.S. AND ASSOCIATED BUFFER (FOR DETAIL REFER TO USOD PERMIT #2003-00826-SDM)
- WHETSTONE RANCH PERMIT PROPERTY BOUNDARY
- SECTION LINE
- 10 TOWNSHIP 18 SOUTH RANGE 20 EAST — SECTION NUMBER, TOWNSHIP AND RANGE

NOTES

1. THIS MAP DEPICTS THE GENERAL LOCATION OF MITIGATION AREAS LYING WITHIN THE WHETSTONE RANCH PERMIT PROPERTY BENEFICIALLY OWNED BY PERMITTEE WHETSTONE PARTNERS, L.L.P., WHICH MITIGATION AREAS ARE REQUIRED TO BE SUBJECTED TO A RESTRICTIVE COVENANT FOR PRESERVATION UNDER THE SCHEDULE AND TERMS SET FORTH IN THE US ARMY CORPS OF ENGINEERS SECTION 404 PERMIT NUMBER 2003-00826-SDM (THE PERMIT). THE LOCATIONS OF THE MITIGATION AREAS ARE MORE PARTICULARLY DESCRIBED ON THE HABITAT MITIGATION AND MONITORING PLAN ATTACHED TO THE PERMIT AND WILL BE FURTHER DEFINED BY SURVEY. THIS MAP NOTIFIES FUTURE LANDOWNERS OF THE MITIGATION AREAS OF THE REQUIREMENT TO RECORD THE RESTRICTIVE COVENANT. THIS MAP EFFECTS ONLY THE MITIGATION AREAS SHOWN IN THE HABITAT MITIGATION AND MONITORING PLAN ATTACHED TO THE PERMIT AND NOT ANY SURROUNDING PROPERTY. UPON RECORDATION OF THE RESTRICTIVE COVENANT CONTAINING LEGAL DESCRIPTION(S) OF ALL OR ANY PORTION OF THE MITIGATION AREA SHOWN ON THIS MAP, THIS MAP SHALL NO LONGER ENCUMBER OR BURDEN TITLE TO THAT PORTION OF THE MITIGATION AREA DESCRIBED BY SAID LEGAL DESCRIPTION(S). FURTHER, UPON RECORDATION OF A MAP OR PLAT CREATING TRACTS OR SUBDIVIVED LOTS, THIS MAP SHALL NO LONGER ENCUMBER OR BURDEN TITLE TO THE PROPERTY DESCRIBED ON SUCH MAP OR PLAT.
2. IMPACT AREAS SHOWN HEREIN ARE APPROXIMATE AND CHANGES TO THEIR LOCATION ON A GIVEN WATER COURSE MAY BE MADE BY PERMITTEE
3. WATERS OF THE U.S. AND ASSOCIATED BUFFERS, SHOWN HEREON, ARE APPROXIMATE AND WILL BE ACCURATELY LOCATED BY SURVEY BEFORE RESTRICTIVE COVENANTS ARE RECORDED.
4. THIS RECORDING IS FOR THE PURPOSE OF SATISFYING SPECIAL CONDITION (C) OF THE U.S. ARMY CORP OF ENGINEERS SECTION 404 PERMIT NUMBER 2003-00826-SDM



400 0 400 800 1200
GRAPHIC SCALE

RBF CONSULTING
PLANNING ■ DESIGN ■ CONSTRUCTION
16605 NORTH 28th AVENUE, SUITE 100
PHOENIX, ARIZONA 85053-7550
602.467.2200 • FAX 602.467.2201 • www.RBF.com

DESIGN/LAYOUT	DRAFTED	CHECKED	MANAGING ENGINEER/SURVEYOR
SHM	AP	SHM	SAMUEL H. MILLS, P.E., R.L.S.
DRAWING SCALE 1"=400'			PROJECT COORDINATION SAMUEL H. MILLS, P.E., R.L.S.

NO.	BY	DESCRIPTION	APP'D	DATE

REVISIONS

WHETSTONE RANCH

PRESERVATION AREA MAP

APPROXIMATE WATERS OF THE U.S. AND ASSOCIATED BUFFERS TO BE PRESERVED BY RESTRICTIVE COVENANT

ORIGINAL PLAN DATE: AUG/2006
LATEST PLAN REVISION: -
SHEET NUMBER: 7 of 9
PROJECT NUMBER: 45102686

Survey Fee #060831384

BK33 PG 6F

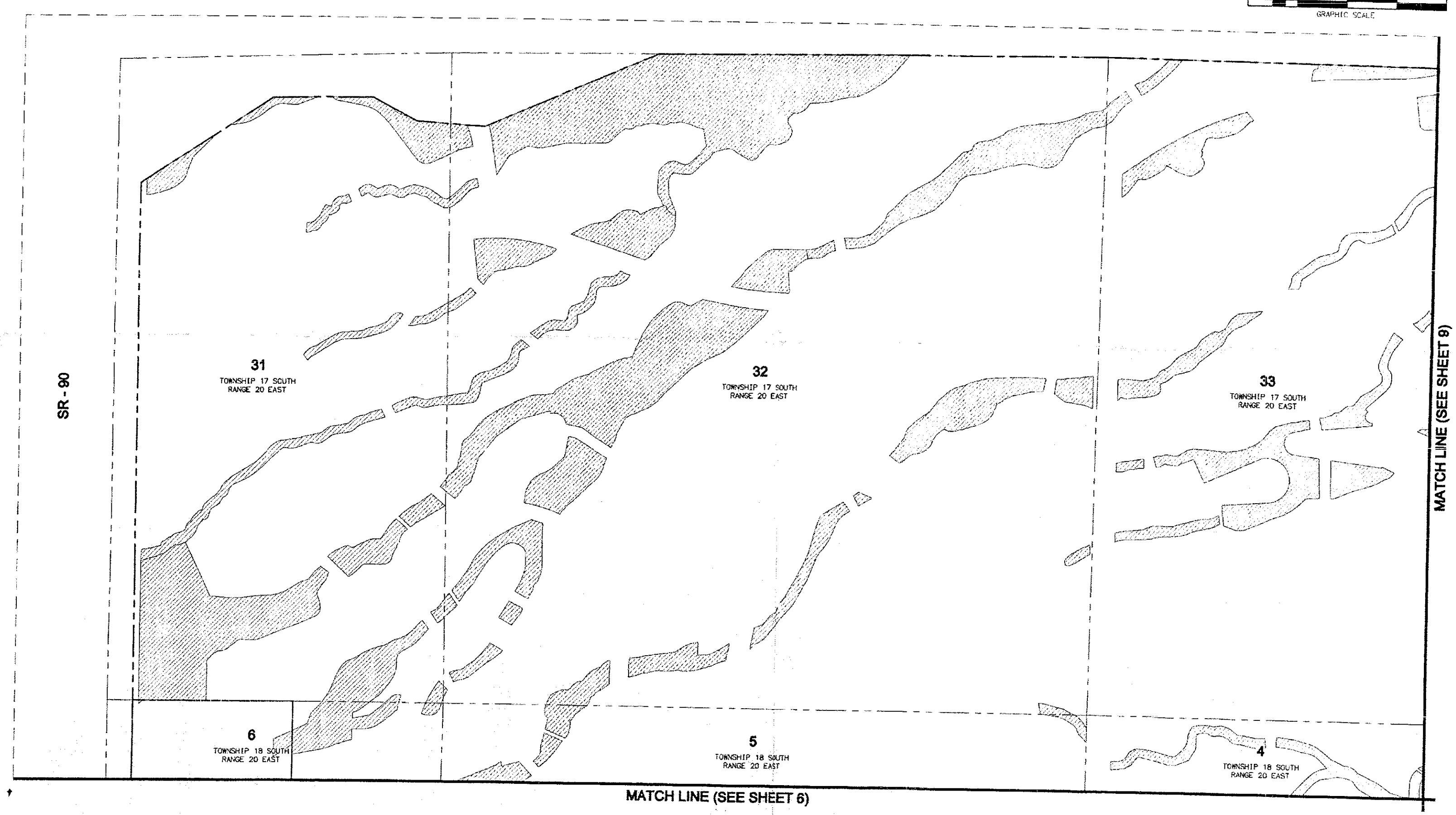
LEGEND

- WATERS OF THE U.S. AND ASSOCIATED BUFFER (FOR DETAIL REFER TO USOD PERMIT #2003-00826-SDM)
- WHETSTONE RANCH PERMIT PROPERTY BOUNDARY
- SECTION LINE
- 10 TOWNSHIP 18 SOUTH RANGE 20 EAST — SECTION NUMBER, TOWNSHIP AND RANGE

NOTES

1. THIS MAP DEPICTS THE GENERAL LOCATION OF MITIGATION AREAS LYING WITHIN THE WHETSTONE RANCH PERMIT PROPERTY BENEFICIALLY OWNED BY PERMITTEE WHETSTONE PARTNERS, L.L.P., WHICH MITIGATION AREAS ARE REQUIRED TO BE SUBJECTED TO A RESTRICTIVE COVENANT FOR PRESERVATION UNDER THE SCHEDULE AND TERMS SET FORTH IN THE US ARMY CORPS OF ENGINEERS SECTION 404 PERMIT NUMBER 2003-00826-SDM (THE PERMIT). THE LOCATIONS OF THE MITIGATION AREAS ARE MORE PARTICULARLY DESCRIBED ON THE HABITAT MITIGATION AND MONITORING PLAN ATTACHED TO THE PERMIT AND WILL BE FURTHER DEFINED BY SURVEY. THIS MAP NOTIFIES FUTURE LANDOWNERS OF THE MITIGATION AREAS OF THE REQUIREMENT TO RECORD THE RESTRICTIVE COVENANT. THIS MAP EFFECTS ONLY THE MITIGATION AREAS SHOWN IN THE HABITAT MITIGATION AND MONITORING PLAN ATTACHED TO THE PERMIT AND NOT ANY SURROUNDING PROPERTY. UPON RECORDATION OF THE RESTRICTIVE COVENANT CONTAINING LEGAL DESCRIPTION(S) OF ALL OR ANY PORTION OF THE MITIGATION AREA SHOWN ON THIS MAP, THIS MAP SHALL NO LONGER ENCUMBER OR BURDEN TITLE TO THAT PORTION OF THE MITIGATION AREA DESCRIBED BY SAID LEGAL DESCRIPTION(S). FURTHER, UPON RECORDATION OF A MAP OR PLAT CREATING TRACTS OR SUBDIVIVED LOTS. THIS MAP SHALL NO LONGER ENCUMBER OR BURDEN TITLE TO THE PROPERTY DESCRIBED ON SUCH MAP OR PLAT
2. IMPACT AREAS SHOWN HEREIN ARE APPROXIMATE AND CHANGES TO THEIR LOCATION ON A GIVEN WATER COURSE MAY BE MADE BY PERMITTEE.
3. WATERS OF THE U.S. AND ASSOCIATED BUFFERS, SHOWN HEREON, ARE APPROXIMATE AND WILL BE ACCURATELY LOCATED BY SURVEY BEFORE RESTRICTIVE COVENANTS ARE RECORDED.
4. THIS RECORDING IS FOR THE PURPOSE OF SATISFYING SPECIAL CONDITION (C) OF THE U.S. ARMY CORP OF ENGINEERS SECTION 404 PERMIT NUMBER 2003-00826-SDM.

400 0 400 800 1200
GRAPHIC SCALE



RBF CONSULTING

REVISIONS

WHETSTONE RANCH

PRESERVATION AREA MAP
APPROXIMATE WATERS OF THE U.S. AND ASSOCIATED BUFFERS TO BE PRESERVED BY RESTRICTIVE COVENANT

AUG/2006

8 of 9

45102686

Survey Fee #06083138 4

BK 33 PG 66

LEGEND

WATERS OF THE U.S. AND ASSOCIATED BUFFER (FOR DETAIL REFER TO USOD PERMIT #2003-00826-SDM)

WHETSTONE RANCH PERMIT PROPERTY BOUNDARY

SECTION LINE

10
TOWNSHIP 18 SOUTH
RANGE 20 EAST
SECTION NUMBER TOWNSHIP AND RANGE

NOTES

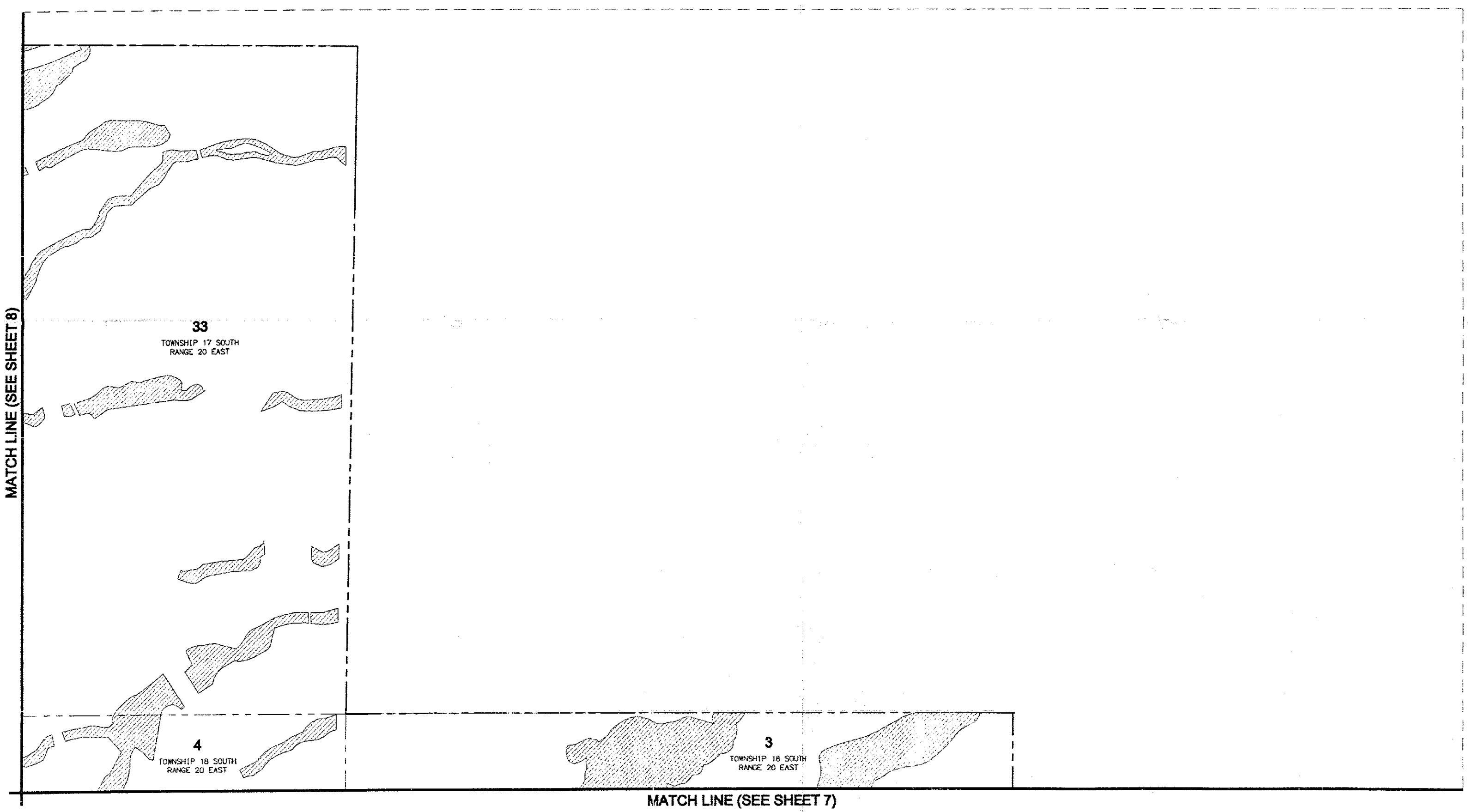
1. THIS MAP DEPICTS THE GENERAL LOCATION OF MITIGATION AREAS LYING WITHIN THE WHETSTONE RANCH PERMIT PROPERTY BENEFICIALLY OWNED BY PERMITTEE WHETSTONE PARTNERS, L.L.P., WHICH MITIGATION AREAS ARE REQUIRED TO BE SUBJECTED TO A RESTRICTIVE COVENANT FOR PRESERVATION UNDER THE SCHEDULE AND TERMS SET FORTH IN THE US ARMY CORPS OF ENGINEERS SECTION 404 PERMIT NUMBER 2003-00826-SDM (THE PERMIT). THE LOCATIONS OF THE MITIGATION AREAS ARE MORE PARTICULARLY DESCRIBED ON THE HABITAT MITIGATION AND MONITORING PLAN ATTACHED TO THE PERMIT AND WILL BE FURTHER DEFINED BY SURVEY. THIS MAP NOTIFIES FUTURE LANDOWNERS OF THE MITIGATION AREAS OF THE REQUIREMENT TO RECORD THE RESTRICTIVE COVENANT. THIS MAP EFFECTS ONLY THE MITIGATION AREAS SHOWN IN THE HABITAT MITIGATION AND MONITORING PLAN ATTACHED TO THE PERMIT AND NOT ANY SURROUNDING PROPERTY. UPON RECORDATION OF THE RESTRICTIVE COVENANT CONTAINING LEGAL DESCRIPTION(S) OF ALL OR ANY PORTION OF THE MITIGATION AREA SHOWN ON THIS MAP, THIS MAP SHALL NO LONGER ENCUMBER OR BURDEN TITLE TO THAT PORTION OF THE MITIGATION AREA DESCRIBED BY SAID LEGAL DESCRIPTION(S). FURTHER, UPON RECORDATION OF A MAP OR PLAT CREATING TRACTS OR SUBDIVIVED LOTS. THIS MAP SHALL NO LONGER ENCUMBER OR BURDEN TITLE TO THE PROPERTY DESCRIBED ON SUCH MAP OR PLAT

2. IMPACT AREAS SHOWN HEREIN ARE APPROXIMATE AND CHANGES TO THEIR LOCATION ON A GIVEN WATER COURSE MAY BE MADE BY PERMITTEE

3. WATERS OF THE U.S. AND ASSOCIATED BUFFERS, SHOWN HEREON, ARE APPROXIMATE AND WILL BE ACCURATELY LOCATED BY SURVEY BEFORE RESTRICTIVE COVENANTS ARE RECORDED

4. THIS RECORDING IS FOR THE PURPOSE OF SATISFYING SPECIAL CONDITION (C) OF THE U.S. ARMY CORP OF ENGINEERS SECTION 404 PERMIT NUMBER 2003-00826-SDM.

400 0 400 800 1200
GRAPHIC SCALE



RBF CONSULTING
PLANNING • DESIGN • CONSTRUCTION

REVISIONS

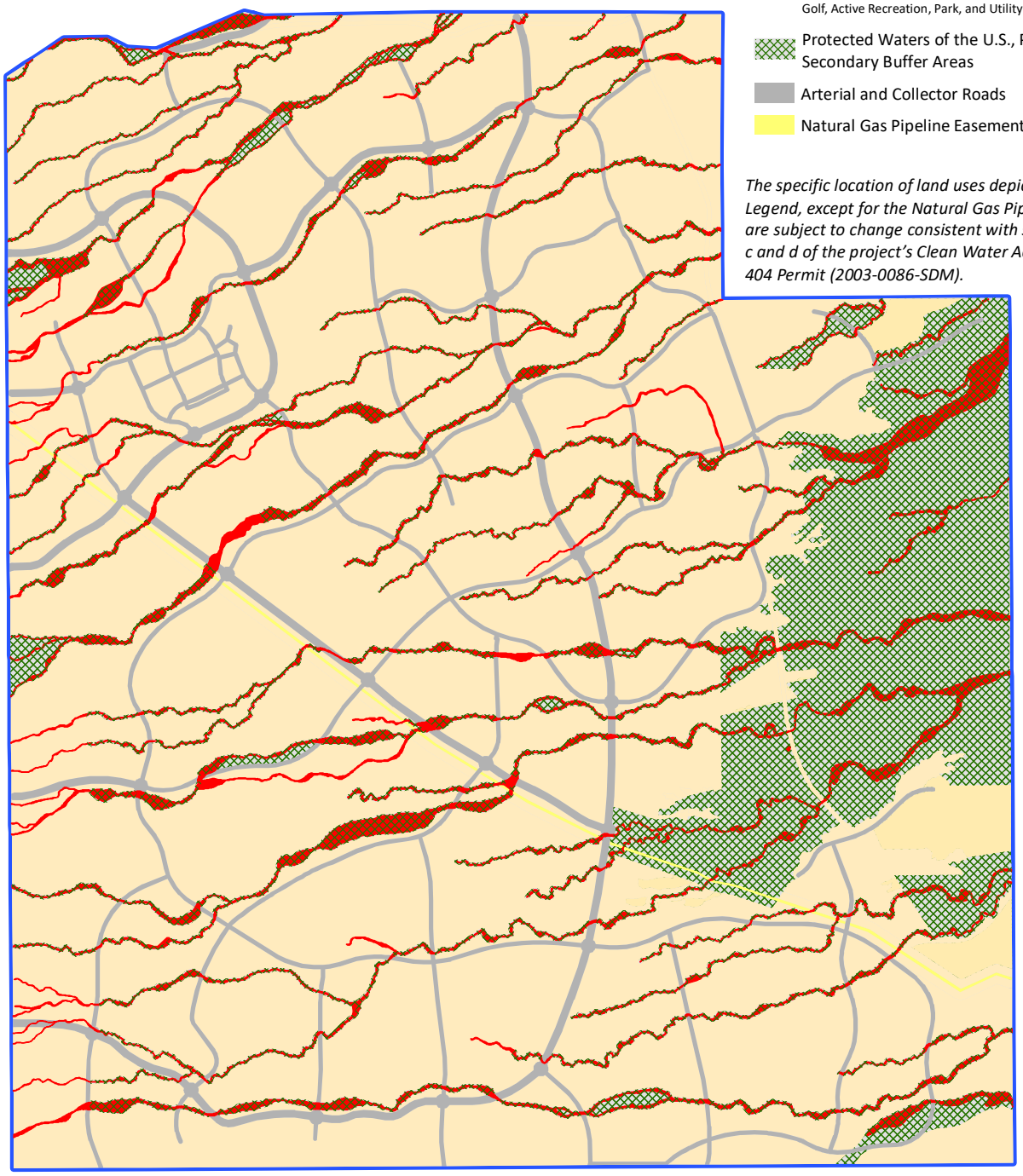
WHETSTONE RANCH
PRESERVATION AREA MAP
APPROXIMATE WATERS OF THE U.S. AND ASSOCIATED BUFFERS TO BE PRESERVED BY RESTRICTIVE COVENANT

AUG/2006

SHEET NUMBER 9 OF 9

45102686

Survey Fee # 060831384   BK 33 PG 6 H



T17S, R20E, Portions of Sections 31-33
T18S, R20E, Portions of Sections 3-10, and 15-18
Cochise County, Arizona,

N

0 1,000 2,000 Feet

0 300 600 Meters

WestLand Resources

Impacts to Waters	Acres
Multiple Use	35.1
Arterial and Collector Roads	14.4
Contingency	1.5
	51.0

El Dorado Benson LLC
PHASE I
VIGNETO MASTER PLAN

Clean Water Act
Section 404 Permit
2003-0086-SDM

MEMORANDUM OF AGREEMENT
BETWEEN
U.S. ARMY CORPS OF ENGINEERS, LOS ANGELES DISTRICT
AND
THE ARIZONA STATE HISTORIC PRESERVATION OFFICE
REGARDING
PHASE 1 OF THE VILLAGES AT VIGNETO PROJECT,
BENSON, COCHISE COUNTY, ARIZONA

WHEREAS, El Dorado Benson, LLC (El Dorado or Permittee), proposes to develop an 8,212-acre master-planned community, hereafter referred to as the "proposed Project," within the larger boundaries of the 15,500-acre "Villages at Vigneto" in Benson, Cochise County, Arizona; and

WHEREAS, in 2006, the U.S. Army Corps of Engineers (Corps) issued a 20-year Department of the Army permit (SPL-2003-00826-SDM) pursuant to Section 404 of the Clean Water Act, 33 U.S.C. 1344, authorizing discharges of dredged or fill material into waters of the United States associated with the proposed Project; and

WHEREAS, on July 20, 2016, the Corps issued a Notice of Permit Suspension having determined it was in the public interest to suspend the permit; and

WHEREAS, the Corps may reinstate the Department of the Army permit (Undertaking) associated with the proposed Project; and

WHEREAS, the Corps is responsible for ensuring compliance with Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, 54 U.S.C. 300101, and its implementing regulations in 36 CFR Part 800; and

WHEREAS, the area of potential effects (APE) for the Undertaking comprises 1,919 acres of private land as depicted in Appendix A of this memorandum of agreement (MOA). The APE encompasses the 144-acre offsite area and 1,775 acres within the 8,212-acre Phase 1 development area comprised of (1) 475 acres of jurisdictional waters of the United States; (2) 100 acres of upland areas adjacent to waters of the United States proposed to be filled; (3) 385 acres of preserved upland areas (primary buffer) within 25 feet of the waters of the United States not proposed to be filled; and (4) 815 acres established as open space preservation (secondary buffer); and

WHEREAS, the Corps has consulted with the Arizona State Historic Preservation Office (SHPO) regarding the identification and evaluation of historic properties within the APE based on the results of two (2) separate Class III cultural resources inventory projects (Jones and Dart 2003 *Cultural Resources Survey of 4,781.92 Acres in T17S, R20E, Section 33, and T18S, R20E, Sections 3, 5, 7, 8, 9, 10, 15, 16, 17, and 18, G&SRB&M, Benson, Arizona*. Letter Report 2003.015. Old Pueblo Archaeology Center, Tucson; and Ezzo and Euler 2004 *Cultural Resources Surveys of the Whetstone Ranch Property, Cochise County, Arizona: A Synthesis Report*. Cultural Resources Report No. 04-137. SWCA, Inc., Tucson), both of which meet the

Secretary of the Interior's Standards and Guidelines for Archaeological Documentation (48 FR 44734-37, September 29, 1983); and

WHEREAS, the Corps has applied the Criteria of Adverse Effect (36 CFR 800.5(a)(1)) and determined the Undertaking will have an adverse effect on portions of five (5) historic properties within the APE including AZ EE:3:57(ASM), AZ EE:3:166(ASM), AZ EE:3:168(ASM), AZ EE:3:172(ASM), and AZ EE:3:175(ASM), and has consulted with the SHPO pursuant to 36 CFR Part 800, and the SHPO has concurred on National Register of Historic Places (NRHP) eligibility determinations and finding of effect (Medley June 11, 2004); and

WHEREAS, portions of two other historic properties within the APE require no treatment, as data recovery has been previously completed at AZ EE:3:74(ASM) prior to the Permittee applying for a Department of the Army permit (Dart 2001; SHPO concurrence October 15, 2001), and AZ EE:12:875(ASM) is exempt from treatment pursuant to the April 5, 2002 Advisory Council on Historic Preservation (ACHP) notice (Federal Register Vol. 67, No. 66); and

WHEREAS, the SHPO is authorized to enter into this MOA in order to fulfill its role of advising and assisting federal agencies in carrying out their responsibilities pursuant to Sections 101 and 106 of the NHPA and 36 CFR 800.2(c)(1)(i) and 800.6(b), and the SHPO is a Signatory to this MOA; and

WHEREAS, the SHPO is authorized to advise and assist federal and state agencies in carrying out their historic preservation responsibilities and cooperate with these agencies under Arizona Revised Statute (A.R.S.) §41-511.04(D)(4); and

WHEREAS, El Dorado is the proposed Project proponent and has been invited to participate in this MOA as a concurring party; and

WHEREAS, in accordance with 36 CFR 800.6(a)(1), the Corps has notified the ACHP of its adverse effect determination, and the ACHP has chosen not to participate in the consultation pursuant to 36 CFR 800.6(a)(1)(iii); and

WHEREAS, the Indian Tribes that may attach religious or cultural importance to affected cultural resources and Traditional Cultural Properties have been consulted pursuant to 36 CFR 800.2(c)(2)(ii)(A-F) and Executive Order 13175, regarding the effects of the Undertaking on historic properties, and the Corps has invited the Gila River Indian Community, the Hopi Tribe, the Pascua Yaqui Tribe, the San Carlos Apache Tribe, the Tohono O'odham Nation, the Tonto Apache Tribe, the White Mountain Apache Tribe, the Yavapai-Apache Nation, the Pueblo of Zuni, and the Fort McDowell Yavapai Nation to participate in this MOA as concurring parties; and

WHEREAS, an agreement with the Permittee regarding the treatment and disposition of any Human Remains, Funerary Objects or Objects of Cultural Patrimony would be developed by the

Arizona State Museum (ASM) pursuant to A.R.S. §41-865 (Burial Agreement), and the Corps has invited ASM to participate in this MOA as a concurring party; and

WHEREAS, the Corps has consulted with the SHPO and the other consulting parties on the adequacy of *Historic Properties Treatment Plan, Villages at Vigneto CWA Section 404 Permitted Activities, Benson, Cochise County, Arizona* (HPTP) by WestLand Resources, Inc. (Lindley revised 2017) and the SHPO reviewed, provided comments, and concurred with the adequacy of the revised HPTP on December 6, 2017 (Appendix B); and

WHEREAS, AZ EE:3:173(ASM) is outside the Corps APE and will be voluntarily treated by the Project proponent pursuant to the HPTP, and the Corps has no responsibility for its treatment; and

WHEREAS, the HPTP includes a long-term monitoring plan that will be implemented on the one-year anniversary of the execution of this MOA if the data recovery is to be phased in accordance with the construction schedule; and

NOW, THEREFORE, the Corps and the SHPO agree that the Undertaking shall be implemented in accordance with the following stipulations in order to resolve the adverse effects of the Undertaking on historic properties and that these stipulations shall govern the Undertaking and all of its parts until this MOA expires or is terminated.

STIPULATIONS

The Corps will ensure the following measures are carried out:

I. Professional Qualifications

The Corps shall ensure all historic preservation work carried out pursuant to this MOA is carried out by, or under the supervision of, a person or persons meeting, at a minimum, the *Secretary of the Interior's Professional Qualifications Standards* (48 FR 44738-44739).

II. Implementation of the Historic Properties Treatment Plan (HPTP)

A. Prior to implementation of the HPTP, the Corps will ensure that a condition and eligibility assessment of all affected sites is undertaken by a qualified archaeologist prior to any construction-related or archaeological ground-disturbing activities. If there are no changes to the current eligibility determinations for the sites, the Corps shall informally consult with the SHPO via e-mail and authorize archaeological investigations to proceed per the approved HPTP. Changes in the eligibility status of one or more sites within the APE will require the Corps to formally consult with the SHPO pursuant to 36 CFR Part 800 for consensus determinations of eligibility and to agree on appropriate treatment, if any. Changes in treatment, if necessary, will be documented in an amendment to the HPTP. The SHPO agrees to expedite this consultation review within a period of fifteen (15) days from receipt of amendment.

B. Any proposed changes to the data recovery plan by the Permittee shall be approved by the Corps in consultation with the SHPO and the concurring parties prior to their implementation.

C. The Corps will incorporate this MOA as a special condition of the Department of the Army permit (SPL-2003-00826), if reinstated by the Corps. If the Permittee fails to carry out the measures necessary to implement the HPTP, the Corps will take steps in good faith to enforce this permit condition or revoke the Department of the Army permit.

D. If data recovery is to be phased according to the construction schedule, the Corps shall ensure that the long-term monitoring plan included in the HPTP and any amendments are implemented on the first anniversary of the execution of this MOA, and that monitoring occurs annually thereafter until data recovery is completed. A report of the results of monitoring may be sent via e-mail to the SHPO if there are no concerns; however, formal consultation shall be required if damage to any site is noted.

III. Preliminary Report(s) and In-field Meeting

A. The Corps shall ensure that the Permittee prepares a draft preliminary end-of-fieldwork (EOF) report within fourteen (14) calendar days of the completion of all Phase 1 data recovery. The EOF report shall summarize the results of the Phase 1 investigations at each site and identify any deviations from the HPTP. If an in-field consultation meeting is held, the Corps shall ensure that the EOF report includes all agreements made during the in-field meeting. The EOF report shall also include a brief description of the field methods and features identified, as well as those activities proposed for Phase 2 data recovery.

B. The Corps shall submit the Phase 1 EOF report concurrently to the SHPO and concurring parties for review and comment, the duration of which shall be a period of ten (10) calendar days from receipt. The Corps shall make a good faith effort to contact all non-responsive parties by phone or e-mail at the end of the review period; lack of response shall not be considered concurrence. All comments shall be provided in writing with copies provided to the other consulting parties. The Corps will take these comments into consideration when directing the Permittee to revise the draft preliminary report. If revisions to the preliminary report are made, the SHPO and concurring parties shall have ten (10) calendar days from receipt to review the revisions and provide comments to the Corps. Failure to respond by any party within the comment period shall not prohibit the Corps from directing the Permittee to finalize the preliminary report. The report will be considered final when the Corps issues written approval of the report.

C. The Permittee shall provide a draft preliminary EOF report within thirty (30) calendar days of the completion of all Phase 2 data recovery. The preliminary report shall include a brief discussion of the fieldwork methods and features identified, and identify

any deviations from the HPTP. The process for review and comment shall follow the steps laid out in Stipulation III.B.

D. If data recovery is phased over time, then a draft EOF report shall be completed for each of the sites.

IV. Review and Comment on Draft Data Recovery Reports

A. The Corps shall ensure the Permittee provides a complete draft data recovery report of findings and analyses resulting from Stipulation II to the Corps within twelve (12) months of the completion of all fieldwork. The draft report shall describe all field methods (including any changes in field methods from those proposed in the HPTP), descriptions of the results of the investigations, results of subsequent analyses, and a discussion of how the results inform on the questions identified in the research design.

B. The Corps shall submit the draft technical report(s) prepared by the Permittee to the SHPO and concurring parties for review and comment, per the steps laid out in Stipulation III.B. The reviewers shall have thirty (30) calendar days from receipt of the draft report to respond to the Corps with comments. The Corps will ensure that the report(s) are finalized to address the comments of reviewers. The Corps shall make a good faith effort to contact all non-responsive parties by phone or e-mail at the end of the review period; lack of response shall not be considered concurrence. Failure to respond by any party within the comment period shall not prohibit the Corps from finalizing said report(s).

C. In the event that the data recovery is done in phases that correspond to the construction sequence, a synthesis report that incorporates the results of all data recovery shall be submitted to the Corps within six (6) months of the approval of the final data recovery report.

D. The Corps shall ensure all final archaeological reports resulting from actions pursuant to this MOA are provided to the SHPO and all concurring parties to this MOA.

V. Authorization to Proceed with Improvements

A. The Corps may authorize the Permittee to proceed with ground-disturbing activities upon the Corps' written approval of the preliminary EOF report(s), subject to the provisions of Stipulation III.B.

B. If the proposed Project is terminated during data recovery for any reason, the Corps and Permittee shall outline the steps to be taken in order to complete any data recovery or other treatment measures (e.g., analysis, interpretation, and reporting) that are in progress at the time of proposed Project termination, and informally consult with the SHPO on its adequacy. A preliminary data recovery report shall be submitted to the SHPO and concurring parties following Stipulation III.

VI. Discovery and Treatment of Human Remains

A. If human remains or funerary objects are discovered during implementation of the Undertaking, the Corps shall ensure the Permittee immediately ceases ground-disturbing activities within a hundred (100)-foot-radius of the discovery, takes steps to protect the discovery, and notifies the Corps and the Director of ASM within twenty-four (24) hours. The Corps shall inform the SHPO. The Corps shall ensure the Permittee treats the human remains in a manner consistent with the ACHP's Policy Statement Regarding Treatment of Burial Sites, Human Remains and Funerary Objects (February 23, 2007).

B. The Corps shall ensure the Permittee makes a good faith effort to ensure that the general public is excluded from viewing any Native American burial site or associated funerary artifacts, and no photographs are taken. The Corps shall ensure that construction does not proceed in the location of the discovery until the Corps receives confirmation from ASM that all requirements of the Burial Agreement are satisfied.

VII. Unanticipated Discoveries of Cultural Resources

A. The HPTP includes specific procedures for managing the discovery of unanticipated cultural resources. If any Signatory determines that implementation of the HPTP or the Undertaking will affect a previously unidentified property that may be eligible for the NRHP, or affect a known historic property in an unanticipated manner, the Corps will address the discovery, or unanticipated effect, in accordance with those provisions of the HPTP that relate to the treatment of discoveries and unanticipated effects. The Corps, at its discretion, may hereunder assume any discovered property to be eligible for inclusion in the NRHP, and that compliance with this stipulation shall satisfy the requirements of 36 C.F.R. §800.13(a)(2).

B. The Corps may allow construction activities by the Permittee to proceed in the area of the discovery after the Corps has determined that implementation of the actions undertaken to address the discovery pursuant to this Stipulation are complete.

VIII. Curation

Within thirty (30) days of the Corps' approval of the final data recovery report, the Corps shall ensure the Permittee deposits all archaeological materials and appropriate field and research notes, maps, drawing and photographic records collected as a result of archaeological investigations arising from this MOA (except where an alternative plan for disposition of human remains is developed in the HPTP or Stipulation VI) for permanent curation with a repository which meets the requirements in 36 CFR 79, Curation of Federally Owned and Administered Archeological Collections. The Corps shall ensure the Permittee provides the Corps with a copy of the curation agreement as evidence of its compliance with this Stipulation. All such items shall be made available to educational institutions and individual scholars for appropriate exhibit and/or research under the operating policies of the selected repository.

IX. Confidentiality

The nature and location of archaeological sites discussed in this MOA and the HPTP shall be maintained as confidential, on a "need to know" basis, limited to staff and agents of the Corps and the SHPO involved in the planning and reviewing of the Undertaking, and qualified researchers consistent with Section 304 of the NHPA.

X. Dispute Resolution

Should the SHPO or any concurring party object in writing to the manner in which the terms of this MOA are implemented, the Corps will consult with the objecting party and other parties and concurring parties to resolve the objection. The Corps shall consult with the objecting party for a period of no more than thirty (30) days from the date of the objection and shall include a site visit if one is requested as part of the consultation. If the Corps determines that the objection cannot be resolved, the Corps shall forward all documentation relevant to the dispute, including the Corps' proposed resolution, to the ACHP for its assistance in resolving the dispute. In the event the ACHP responds in thirty (30) days, the Corps shall, prior to reaching a final decision on the dispute, prepare a written response that takes into account the recommendation or comments provided by the ACHP pertaining to the subject of the dispute, and provide the SHPO and concurring parties with a copy of this written response. Otherwise, the Corps will render a final decision regarding the objection, taking into account the comments of the SHPO or concurring parties that have submitted timely comments to the Corps, and notify the SHPO and concurring parties of the decision in writing, within fourteen (14) days after completing consultation. The Corps' responsibility to carry out all actions under this MOA that are not subject of a dispute will remain unchanged. The Corps may authorize any action subject to objection under this stipulation to proceed after the objection has been resolved in accordance with the terms of this Stipulation.

XI. Amendments

Any Signatory to this MOA may propose that the MOA be amended, whereupon the Signatories will consult with each other to consider such an amendment. This MOA may be amended when such an amendment is agreed to in writing by all Signatories. The amendment will be effective on the date a copy signed by all of the Signatories is filed with the ACHP. The Corps shall provide all concurring parties with a copy of the executed amendment.

XII. Duration of the MOA

A. This MOA will be null and void if its stipulations are not carried out within ten (10) years from the date of its execution, unless the Signatories agree in writing to an extension in accordance with Stipulation XI.

B. The Corps shall ensure the Permittee fulfills the requirements of this MOA prior to and in conjunction with the work authorized by the Department of the Army permit, if reinstated. All obligations under this MOA must be complete before expiration of this MOA.

XIII. Termination

If any Signatory to this MOA determines that its terms will not or cannot be carried out, that party shall immediately consult with the other Signatories to attempt to develop an amendment per Stipulation XI, above. If within thirty (30) days (or another time period agreed to by all Signatories) an amendment cannot be reached, any Signatory may terminate the MOA upon written notification to the other Signatories. Once the MOA is terminated, and prior to work continuing on the Undertaking, the Corps must either (a) execute an MOA pursuant to 36 CFR 800.6 or (b) request, take into account, and respond to the comments of the ACHP under 36 CFR 800.7. The Corps shall notify the SHPO as to the course of action it will pursue.

XIV. Counterpart Signatures

This MOA may be executed in counterparts, each of which shall be deemed an original and all of which together shall constitute one and the same instrument.

Execution of this MOA by the Corps and the SHPO, and subsequent implementation of its terms, evidences the Corps has taken into account the effects of the Undertaking on historic properties, has afforded the ACHP an opportunity to comment, and has satisfied its responsibilities under Section 106 of the NHPA and applicable implementing regulations.

SIGNATORIES:

UNITED STATES ARMY CORPS OF ENGINEERS

By:  Digitally signed by CASTANON.DAVID.J.1231966150 DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USA, cn=CASTANON.DAVID.J.1231966150 Date: 2018.03.02 11:00:23 -08'00' Date: March 2, 2018

Name: David J. Castanon
Title: Chief, Regulatory Division

ARIZONA STATE HISTORIC PRESERVATION OFFICE

By:_____ Date:_____

Name: Kathryn Leonard
Title: Arizona State Historic Preservation Officer

CONCURRING PARTIES:

EL DORADO BENSON, LLC

By: _____ Date:_____

Name:
Title:

GILA RIVER INDIAN COMMUNITY

By:_____ Date:_____

Name: Barnaby Lewis
Title: Tribal Historic Preservation Officer

Execution of this MOA by the Corps and the SHPO, and subsequent implementation of its terms, evidences the Corps has taken into account the effects of the Undertaking on historic properties, has afforded the ACHP an opportunity to comment, and has satisfied its responsibilities under Section 106 of the NHPA and applicable implementing regulations.

SIGNATORIES:

UNITED STATES ARMY CORPS OF ENGINEERS

By: David J. Castanon Digitally signed by CASTANON.DAVID.J.1231966150 DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USA, cn=CASTANON.DAVID.J.1231966150 Date: 2018.03.02 11:00:23 -08'00' Date: March 2, 2018

Name: David J. Castanon
Title: Chief, Regulatory Division

ARIZONA STATE HISTORIC PRESERVATION OFFICE

By: Kathryn Leonard Date: 8 March 2018

Name: Kathryn Leonard
Title: Arizona State Historic Preservation Officer

CONCURRING PARTIES:

EL DORADO BENSON, LLC

By: _____ Date: _____

Name:
Title:

GILA RIVER INDIAN COMMUNITY

By: _____ Date: _____

Name: Barnaby Lewis
Title: Tribal Historic Preservation Officer

Execution of this MOA by the Corps and the SHPO, and subsequent implementation of its terms, evidences the Corps has taken into account the effects of the Undertaking on historic properties, has afforded the ACHP an opportunity to comment, and has satisfied its responsibilities under Section 106 of the NHPA and applicable implementing regulations.

SIGNATORIES:

UNITED STATES ARMY CORPS OF ENGINEERS

By:_____ Date:_____

Name: David J. Castanon
Title: Chief, Regulatory Division

ARIZONA STATE HISTORIC PRESERVATION OFFICE

By:_____ Date:_____

Name: Kathryn Leonard
Title: Arizona State Historic Preservation Officer

CONCURRING PARTIES:

EL DORADO BENSON, LLC

By: El Dorado Holdings, Inc
its administrative Agent

By: _____ Date: 3/7/18

Name: Michael T. Reinbold
Title: Administrative Agent

GILA RIVER INDIAN COMMUNITY

By:_____ Date:_____

Name: Barnaby Lewis
Title: Tribal Historic Preservation Officer

PASCUA YAQUI TRIBE

By:_____ Date:_____

Name: Robert Valencia
Title: Chairman

SAN CARLOS APACHE TRIBE

By:_____ Date: 4/6/18

Name: Terry Rambler
Title: Chairman

HOPI TRIBE

By:_____ Date:_____

Name: Stewart Koyiyumptewa
Title: Director Cultural Resource Office

TOHONO O'ODHAM NATION

By:_____ Date:_____

Name: Edward Manuel
Title: Chairman

YAVAPAI-APACHE NATION

By:_____ Date:_____

Name: Chris Coder
Title: Tribal Archaeologist

AK CHIN INDIAN COMMUNITY

By:_____ Date:_____

Name: Ms. Bernadette Carra
Title: Cultural Resource Specialist, Land Management

WHITE MOUNTAIN APACHE TRIBE

By:_____ Date:_____

Name: Mr. Mark Altaha
Title: Tribal Historic Preservation Officer

SALT RIVER-MARICOPA INDIAN COMMUNITY

By:_____ Date:_____

Name: Ms. Angela Garcia-Lewis
Title: Cultural Preservation Compliance Supervisor

PUEBLO OF ZUNI

By: _____ Date:_____

Name: Kurt Dongoske
Title: Tribal Historic Preservation Officer

FORT MCDOWELL YAVAPAI NATION

By: _____ Date:_____

Name: Bernadine Burnett
Title: President

TONTO APACHE TRIBE

By:_____ Date:_____

Name: Jeri De Cola
Title: Chairwoman

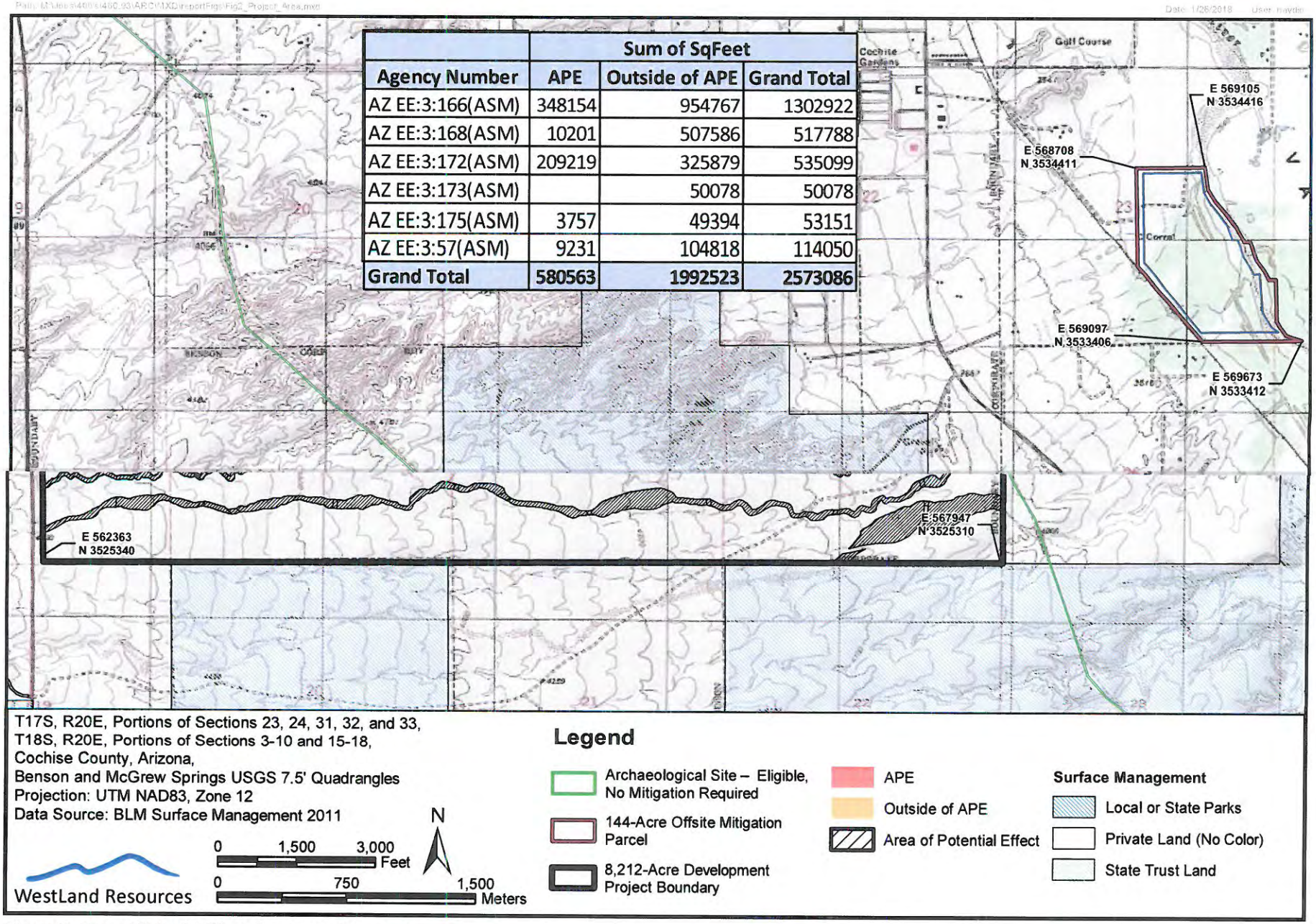
ARIZONA STATE MUSEUM

By:_____ Date: 4/12/18

Name: Patrick Lyons
Title: Director

APPENDIX A

Area of Potential Effects



	Sum of SqFeet		
Agency Number	APE	Outside of APE	Grand Total
AZ EE:3:166(ASM)	348154	954767	1302922
AZ EE:3:168(ASM)	10201	507586	517788
AZ EE:3:172(ASM)	209219	325879	535099
AZ EE:3:173(ASM)		50078	50078
AZ EE:3:175(ASM)	3757	49394	53151
AZ EE:3:57(ASM)	9231	104818	114050
Grand Total	**580563**	**1992523**	**2573086**

Figure 2. Area of Potential Effect showing surface management

APPENDIX B

Approved Historic Properties Treatment Plan, Villages at Vigneto CWA Section 404 Permitted Activities, Benson, Cochise County, Arizona

HISTORIC PROPERTIES TREATMENT PLAN
VILLAGES AT VIGNETO
CWA SECTION 404 PERMITTED ACTIVITIES
BENSON, COCHISE COUNTY, ARIZONA

El Dorado Benson, LLC

Prepared by:
John M. Lindly, Ph.D.

Reviewed and submitted by:
Fred Huntington

Cultural Resources Report 2012-3

December 6, 2017
Project Number: 460.66 (REV)

U.S. Army Corps of Engineers File No. 2003-00826-SDM

WestLand Resources

WestLand Resources, Inc. • 4001 E. Paradise Falls Drive • Tucson, Arizona 85712 • 520•206•9585

TABLE OF CONTENTS

ABSTRACT iv
CHAPTER 1: INTRODUCTION AND PROJECT BACKGROUND 1
Environmental Background 4
CHAPTER 2: ARCHAEOLOGICAL SITE DESCRIPTIONS 6
Site Descriptions 7
Historic Period Sites 7
AZ EE:3:57(ASM) 8
AZ EE:3:166(ASM) 10
AZ EE:3:168(ASM) 12
Prehistoric Period Sites 14
AZ EE:3:172(ASM) 14
AZ EE:3:173(ASM) 16
AZ EE:3:175(ASM) 18
CHAPTER 3: RESEARCH DESIGN 20
Archaeological Background of the Surrounding Region 20
Cultural Background for Central and Southern Arizona 20
Paleoindian Period (pre-8500 B.C.) 20
Archaic Period (8500 B.C.–A.D. 1) 21
Formative Period (A.D. 1–1450) 23
Protohistoric Period (A.D. 1450–1691) 26
The Spanish Entrada 26
Historic Period (A.D. 1691–1950) 28
Research Themes 31
Research Theme 1: Archaic Period (8500 B.C.–A.D. 1) Utilization of the Development Property Area 31
Culture History 31
Mobility, Landscape Use, Subsistence, and Resource Procurement 32
Settlement, Site Structure, and Site Function 32
Research Theme 2: Formative Period (A.D. 1–1450) Native American Utilization of the Development Project Area 33
Chronology 33
Cultural Affiliation and Regional Interaction 34
Typological and Functional Analysis 34
Research Theme 3: Historic Period (ca. 1911–1912) Railroad Construction in the Development Project Area 35
Chronology 36
The Built Environment 36
Household Archaeology 37
Ethnicity and Ethnic Relations 39
Research Theme 4: Historic Period (ca. 1911–1912) Railroads in the Development Project Area 40
CHAPTER 4: WORK PLAN 41
Site Assessment 41
Data Recovery Plan 41
Phase 1 42

Task 1: Reconnaissance and Surface Artifact Collections 42
Task 2: Subsurface Exploration at the Archaic Hunting Sites 43
Task 3: Subsurface Explorations at the Formative Period Resource-procurement and/or Processing Site 43
Task 4: Subsurface Explorations at Historic Period Railroad Camps 43
Phase 2 Data Recovery 44
Task 1: Data Recovery at the Archaic Hunting Sites 44
Task 2: Data Recovery at the Formative Period Resource-procurement and/or Processing Site 45
Task 3: Data Recovery at Historic Period Railroad Camps 45
Research Methods 45
Field Methods 45
Proveniencing, Inventory, and Quality Assurance 45
Spatial Control of the Archaeological Record 46
Feature Recording 46
Hand-excavation 46
Extramural Feature Excavation 47
Architectural Features 47
Mortuary Excavation 49
Field Records 49
Analysis Methods 49
Chronometric Samples 49
Flaked Stone Analysis 49
Ground Stone Analysis 50
Ceramic Analysis 50
Marine Shell Analysis 50
Faunal Analysis 51
Human Remains 51
Paleobotanical and Palynological Analysis 51
Historical Artifacts 51
Reporting 53
Curation 54
Schedule for Completion 54
Archaeological Monitoring and Discovery Plan 55
Long-term Monitoring Plan 56
Additional Recommendations 56
REFERENCES 57

FIGURES

Figure 1. Vicinity map 2
Figure 2. Area of Potential Effect showing surface management 4a
Figure 3. AZ EE:3:57(ASM) 9
Figure 4. AZ EE:3:166(ASM) 11
Figure 5. AZ EE:3:168(ASM) 13
Figure 6. AZ EE:3:172(ASM) 15
Figure 7. AZ EE:3:173(ASM) 17
Figure 8. AZ EE:3:175(ASM) 19

TABLES

Table 1. Affected sites 4

APPENDICES

Appendix A:

- U.S. Army Corps of Engineers Memorandum for Record: Comments on *A Historic Properties Treatment Plan for the Whetstone Ranch Property, Cochise County, Arizona* (March 21, 2007)
- Arizona State Historic Preservation Office Comments on Whetstone Ranch, Benson Project (June 11, 2004)

Appendix B:

- The El Paso and Southwestern Rail Road in Benson, Arizona – Railway Features and Artifacts on the Whetstone Ranch and Arizona State Trust Properties

ABSTRACT

REPORT TITLE: Historic Properties Treatment Plan: Villages at Vigneto CWA Section 404 Permitted Activities, Benson, Cochise County, Arizona

REPORT DATE: December 6, 2017

AGENCY: U.S. Army Corps of Engineers

AGENCY APPLICATION NUMBER: Corps File No. 2003-00826-SDM

PROJECT SPONSOR: El Dorado Benson, LLC

PROJECT DESCRIPTION: This document provides an archaeological data recovery plan to mitigate adverse effects to six National Register of Historic Places-eligible properties. These adverse effects would result from development activities associated with the Clean Water Act Section 404 permit issued by the U.S. Army Corps of Engineers (Corps) for the Villages at Vigneto (Corps File No. 2003-00826-SDM). The Corps' Scope of Analysis was determined to include 1,775 acres of the 8,212-acre development project property and 144 acres for offsite mitigation (Area of Potential Effect [APE]). A seventh site determined to be National Register of Historic Places-eligible and within the APE of the Corps—AZ EE:12:875(ASM), an El Paso Natural Gas pipeline—has no treatment recommended because the site is exempt pursuant to the Advisory Council on Historic Preservation's notice dated April 5, 2002 (*Federal Register* Vol. 67, No. 66). In addition, the adverse effects of the project on the portion of the El Paso and Southwestern Railroad, AZ EE:3:74(ASM), within the APE have been previously mitigated (Jones and Dart 2001b, SHPO-2000-2695). As the Section 404 permit issued by the Corps allows for the movement of the proposed permit impacts, which would result in associated changes to the APE, El Dorado Benson, LLC, has agreed to mitigate all areas of the six sites requiring mitigation within the 8,212-acre development project property.

PROJECT NUMBER: 460.66 (WestLand revised)

LOCATION: The APE comprises the 1,775-acre development project property and the 144-acre offsite mitigation parcel. The 1,775-acre development project property is located within the 8,212-acre Villages at Vigneto master-planned community located in Benson, Cochise County, in Township 17 South, Range 20 East, portions of Sections 31 through 33; and Township 18 South, Range 20 East, portions of Sections 3 through 10 and 15 through 18; Gila and Salt River Baseline and Meridian; Benson and McGrew Springs USGS 7.5' quadrangles. The 144-acre offsite mitigation parcel is located in unincorporated Cochise County in Township 17 South, Range 20 East, portions of Sections 23 and 24; Gila and Salt River Baseline and Meridian; Benson USGS 7.5' quadrangle.

NATIONAL REGISTER OF HISTORIC PLACES-ELIGIBLE PROPERTIES WITHIN THE APE: Eight, per consultation between the Corps and the Arizona State Historic Preservation Office (Holmes 2007; Medley 2004). One site, AZ EE:3:74(ASM), has been previously mitigated, and AZ AA:12:875(ASM), an El Paso Natural Gas pipeline, is exempt from treatment pursuant to the Advisory Council on Historic Preservation's notice dated April 5, 2002 (*Federal Register* Vol. 67, No. 66).

CHAPTER 1: INTRODUCTION AND PROJECT BACKGROUND

In 2006, the U.S. Army Corps of Engineers (Corps) issued an individual Clean Water Act (CWA) Section 404 permit authorizing the discharge of fill material to 51 acres of waters of the United States within a proposed 8,212-acre development project property in the city of Benson, Arizona. The permit holder, El Dorado Benson, LLC, intends to discharge fill material into ephemeral drainages for pad fill and road and utility crossings (Permitted Activities, Corps File No. 2003-00826-SDM) associated with their 8,212-acre development project. The CWA permit requires the preservation of 1,624 acres of natural open space within the development project property. The CWA permit also requires the enhancement of approximately 144 acres off site from the development project property to mitigate for unavoidable impacts to Waters. El Dorado Benson, LLC, contracted WestLand Resources, Inc. (WestLand), to conduct a phased data recovery project on six National Register of Historic Places-eligible sites that occur within portions of the 8,212-acre development project property.

The Corps Area of Potential Effect (APE) evaluated for the project consists of the effects of the Permitted Activities associated with the 8,212-acre development project and 144-acre offsite mitigation parcel that are subject to discretionary Federal control or responsibility. These are activities that are the products of Federal financing, assistance, direction, regulation, or approval, including the Corps Permit, and are subject to sufficient Federal agency control and responsibility as to federalize the otherwise private development activities. The Corps Permit is the only Federal permit or authorization required in connection with the proposed development project. There is no other Federal involvement in or control over the project.

As described in the Environmental Assessment (EA), the EA Supplement prepared by the Corps for the CWA permit, and the 2017 Memorandum for Record, the Federal scope of analysis and APE includes approximately 1,775 acres within the proposed 8,212-acre development project, plus the 144-acre offsite mitigation parcel **(Figure 1)**. All of these properties are located on private lands within or near the city of Benson. The 144-acre offsite mitigation parcel does not have any National Register of Historic Places-eligible sites (Gruner 2016) and is not considered further in this Historic Properties Treatment Plan (HPTP). The APE within the 8,212-acre development project property includes:

1. All waters of the United States, which constitute 475 acres within the 8,212-acre development project property;

2. Upland areas adjacent to the 51 acres of waters of the United States that will be impacted by fill, encompassing an area approximately twice the fill area (100 acres), where the upland activity is directly affected by the location or configuration of the Permitted Activities;

3. 385 acres established through preserving the upland area within 25 feet of waters of the United States that will not be impacted by fill (Primary Buffer); and

4. 815 acres of additional upland areas established as open space preservation (Secondary Buffer).

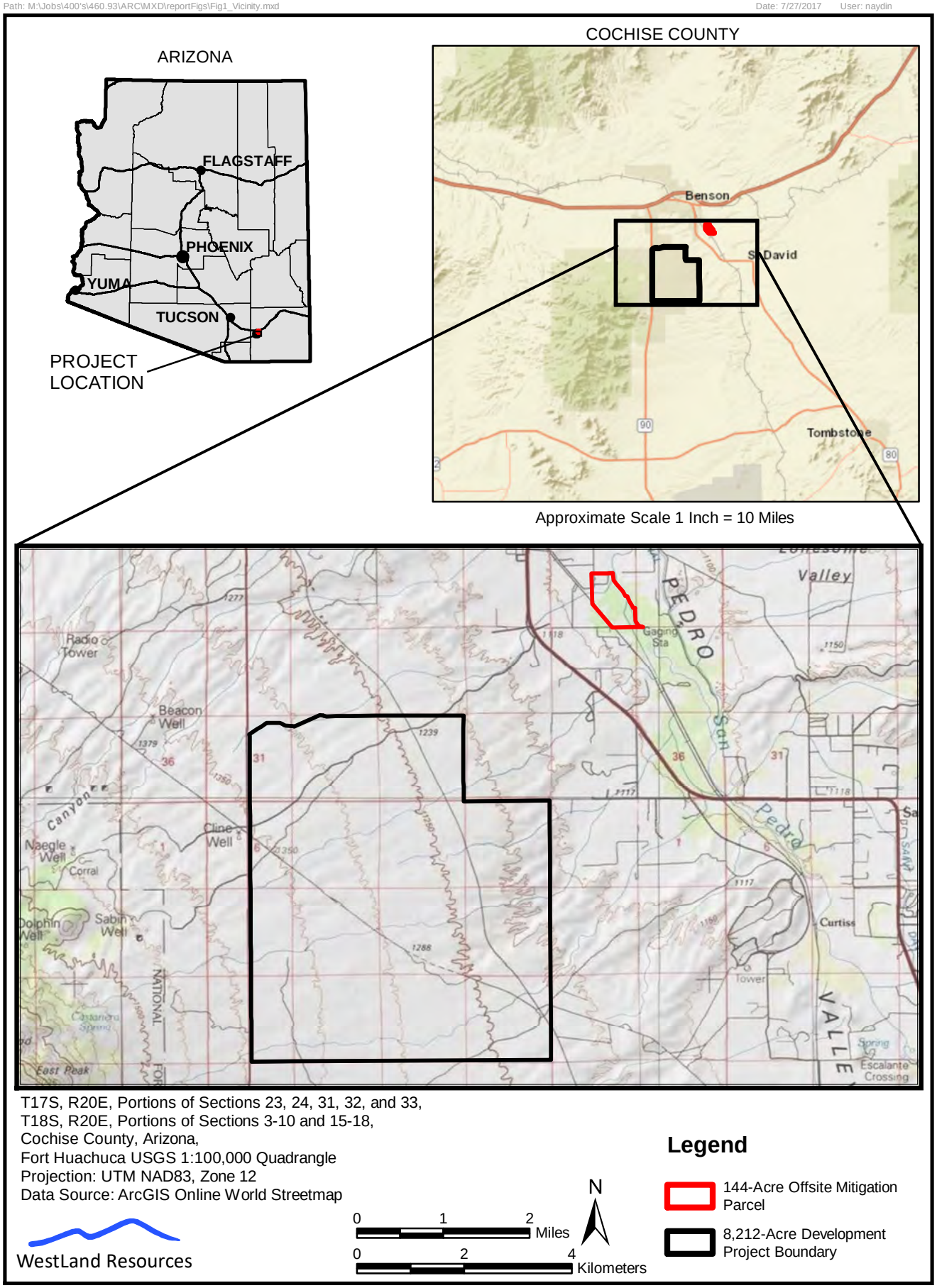


Figure 1. Vicinity map

The current Corps APE within the 8,212-acre development project, as defined above, is depicted on **Figure 2**. El Dorado Benson, LLC, has agreed to mitigate all areas of the six National Register of Historic Places-eligible sites requiring mitigation within the 8,212-acre development project property. These sites are shown on **Figure 2**.

At the time the Corps permit was issued, an HPTP (Ezzo et al. 2004) had been submitted for review. Comments on the document were issued by the Corps (Holmes 2007; **Appendix A**) and the Arizona State Historic Preservation Office (SHPO) (Medley 2004; **Appendix A**), but due to a downturn in the economy, project development did not proceed and the HPTP was never finalized.

This HPTP is an original document and does not constitute a revision of the 2004 HPTP (Ezzo et al. 2004). It has been written in such a way as to address the comments on the 2004 HPTP made by the Corps and the SHPO (Holmes 2007; Medley 2004 **[Appendix A]**). A previous draft of this report (Lindly 2012) was filed with the Corps. The Corps asked that the document be revised to be consistent with the description of the geographic scope of analysis identified in their EA prepared for the original permit.

Portions of the APE and surrounding lands were surveyed for cultural properties during various Class III cultural resources inventory projects (Bowers 2004; Ezzo and Euler 2004a; Gruner 2016; Jones 2000, 2001; Jones and Dart 2001a, 2003; Kahldahl et al. 2001; Wenker 1996). A compilation of the portions of all reports pertaining to the Whetstone Ranch project (the previous name of the Villages at Vigneto project) was completed by SWCA to facilitate the review process (Ezzo and Euler 2004b) **(Appendix B)**.

Old Pueblo Archaeology Center's inventory identified 24 archaeological sites of which 14 were recommended eligible for inclusion in the National Register of Historic Places. From this list, the Corps—in consultation with the SHPO (Holmes 2007; Medley 2004)—determined that eight sites within the 8,212-acre development project property were eligible for the National Register of Historic Places **(Figure 2 and Appendix A)**:

- AZ EE:12:875(ASM)
- AZ EE:3:57(ASM)
- AZ EE:3:74(ASM)
- AZ EE:3:166(ASM)
- AZ EE:3:168(ASM)
- AZ EE:3:172(ASM)
- AZ EE:3:173(ASM), and
- AZ EE:3:175(ASM)

One site—AZ EE:3:74(ASM), the El Paso and Southwestern Railroad—has already been adequately documented within the APE to mitigate the adverse effects of this project and will not be addressed by this plan (Jones and Dart 2001b). This site was fully documented in the Villages at Vigneto area by Old Pueblo Archaeology, and it was recommended (Jones and Dart 2001b:48–50)

that the documentation was sufficient to mitigate any effects that the development (then known as the Whetstone Ranch project) might have on AZ EE:3:74(ASM). In a later document, Old Pueblo Archaeology reported that the SHPO had concurred with this recommendation (Jones and Dart 2003:10). Therefore, it is WestLand's understanding that mitigation has been completed for this site within the APE by the prior work of Old Pueblo Archaeology.

AZ EE:12:875(ASM)—an El Paso Natural Gas pipeline—is exempt from treatment under Section 106 of the National Historic Preservation Act pursuant to the Advisory Council on Historic Preservation's notice dated April 5, 2002 (Advisory Council on Historic Preservation 2002a, 2002b; *Federal Register* Vol. 67, No. 66) and will not be addressed in this HPTP.

Five of the remaining six sites within the 8,212-acre development project property are located partially or wholly within the APE and could be adversely affected by the Permitted Activities. AZ EE:3:173(ASM) is outside the Corps APE, and El Dorado Benson, LLC, has agreed to include this site in the mitigation efforts. Thus El Dorado Benson, LLC, has agreed to mitigate all areas of the remaining six sites—AZ EE:3:57, AZ EE:3:166, AZ EE:3:168, AZ EE:3:172, AZ EE:3:173, and AZ EE:3:175 (all ASM)—within the 8,212-acre development project property, as shown in **Table 1**. This HPTP has been prepared in accordance with SHPO and Arizona State Museum (ASM) standards for a data recovery plan and presents the archaeological background, research program, and data recovery methods relevant to the project.

Table 1. Affected sites

Site Number	Eligibility	Treatment Recommendation
AZ EE:3:57(ASM)	Determined eligible by the SHPO	Mitigation of effects to the site
AZ EE:3:166(ASM)	Determined eligible by the SHPO	Mitigation of effects to the site
AZ EE:3:168(ASM)	Determined eligible by the SHPO	Mitigation of effects to the site
AZ EE:3:172(ASM)	Determined eligible by the SHPO	Mitigation of effects to the site
AZ EE:3:173(ASM)	Determined eligible by the SHPO	Mitigation of effects to the site
AZ EE:3:175(ASM)	Determined eligible by the SHPO	Mitigation of effects to the site

ENVIRONMENTAL BACKGROUND

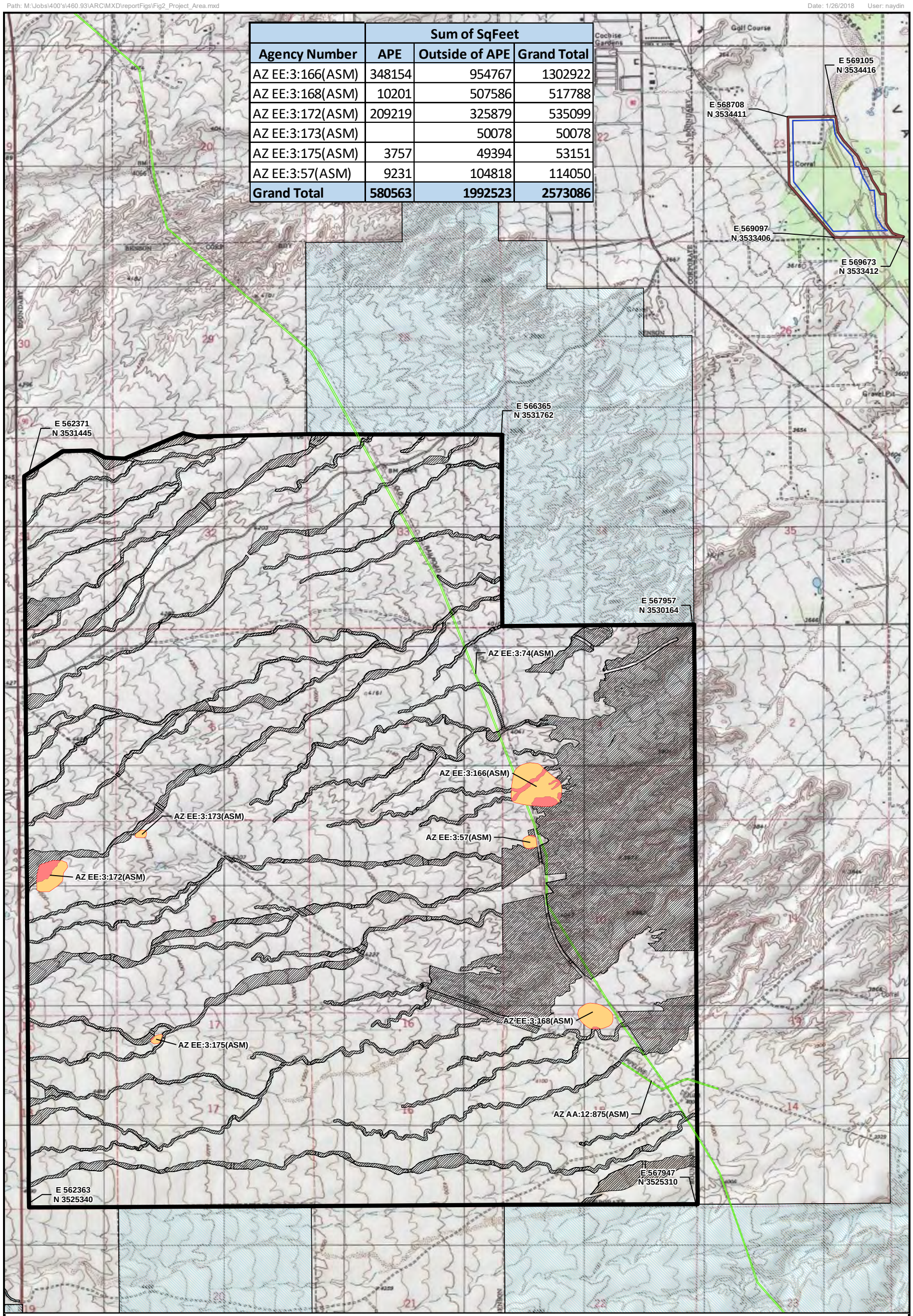
The sites in question are located on the dissected middle and lower bajadas of the Whetstone Mountains within the Basin and Range physiographic province. Elevations range from 3,800 to 4,590 feet (1,158 to 1,399 meters) above mean sea level. Soils are old alluviums derived from igneous and sedimentary rocks and are classified as part of the Nickel-Latene-Cave Association (Hendricks 1985:107).

Vegetation in the APE is classified as Chihuahuan Desertscrub and Semidesert Grassland (Brown and Lowe 1994), which are characterized by bunch grasses or low-growing sod grasses that co-exist with woody plants, leaf succulents, and/or cacti. Semidesert Grassland is the dominant plant community and consists of a variety of grasses and widely scattered trees and shrubs. Grasses

Path: M:\Jobs\400's\460.93\ARC\MXD\reportFigs\Fig2_Project_Area.mxd

Date: 1/26/2018 User: naydin

	Sum of SqFeet		
Agency Number	**APE**	**Outside of APE**	**Grand Total**
AZ EE:3:166(ASM)	348154	954767	1302922
AZ EE:3:168(ASM)	10201	507586	517788
AZ EE:3:172(ASM)	209219	325879	535099
AZ EE:3:173(ASM)		50078	50078
AZ EE:3:175(ASM)	3757	49394	53151
AZ EE:3:57(ASM)	9231	104818	114050
Grand Total	**580563**	**1992523**	**2573086**



T17S, R20E, Portions of Sections 23, 24, 31, 32, and 33,
T18S, R20E, Portions of Sections 3-10 and 15-18,
Cochise County, Arizona,
Benson and McGrew Springs USGS 7.5' Quadrangles
Projection: UTM NAD83, Zone 12
Data Source: BLM Surface Management 2011

WestLand Resources

0 1,500 3,000 Feet

0 750 1,500 Meters

N

Legend

- Archaeological Site – Eligible, No Mitigation Required
- 144-Acre Offsite Mitigation Parcel
- 8,212-Acre Development Project Boundary
- APE
- Outside of APE
- Area of Potential Effect

Surface Management

- Local or State Parks
- Private Land (No Color)
- State Trust Land

Figure 2. Area of Potential Effect showing surface management

include three awn (*Aristida purpurea*), Arizona cottontop (*Digitaria californica*), big sacaton (*Sporabolus wrightii*), Lehmann's lovegrass (*Erogostis lehmannii*), and grama grasses (*Bouteloua* sp.). Dominant trees and shrubs include velvet mesquite (*Prosopis velutina*), catclaw acacia (*Acacia greggii*), and whitethorn acacia (*Acacia constricta*). The cacti and succulents that are present on the property include ocotillo (*Fouquiera splendens*), agave (*Agave* sp.), banana yucca (*Yucca baccata*), barrel cactus (*Ferocactus wislizenii*), and several species of *Opuntia.*

Wildlife species in the area are typical of those commonly associated with the Chihuahuan Desertscrub and Semidesert Grassland vegetation communities. Bird species observed in the APE include black-throated sparrow, house finch, Harris hawk, cactus wren, Gamble's quail, mourning dove, American kestrel, and verdin. Larger mammals in the area include javelina, mule deer, and coyote.

CHAPTER 2: ARCHAEOLOGICAL SITE DESCRIPTIONS

The six sites that are the subject of this HPTP represent prehistoric Native American through Historic period Euroamerican use of the lower bajada of the Whetstone Mountains. Eight sites within the development property were considered eligible for inclusion in the National Register of Historic Places by the Corps (in consultation with the SHPO). However, the El Paso Natural Gas pipeline, AZ AA:12:875(ASM), is exempt from treatment under Section 106 of the National Historic Preservation Act pursuant to the Advisory Council on Historic Preservation's notice dated April 5, 2002 (ACHP 2002a, 2002b; *Federal Register* Vol. 67, No. 66). The adverse effects to AZ EE:3:74(ASM), the El Paso and Southwestern Railroad, have been previously mitigated through research and documentation by Old Pueblo Archaeology Center (Jones and Dart 2001b).

The six remaining sites to be addressed by this treatment plan represent several different site types based on age, cultural affiliation, and function. Recognized site types consist of Archaic hunting sites (AZ EE:3:172 and AZ EE:3:173 [both ASM]); a Formative period Native American resource-procurement and/or processing site (AZ EE:3:175[ASM]); and Historic period Euro-american railroad construction camps (AZ EE:3:57, AZ EE:3:166, and AZ EE:3:168 [all ASM]).

SITE DESCRIPTIONS

Historic Period Sites

The site descriptions for the Historic period sites appear on the following pages.

AZ EE:3:57(ASM)

- Jones and Dart 2003

AZ EE:3:57(ASM) **(Figure 3)** is a small scatter of historical artifacts, a pile of hardened cement in which the forms of the original bags are still distinguishable, and at least one area where rock alignments and wooden stakes suggest a tent was placed. The site is interpreted as a work camp for the construction of the El Paso and Southwestern Railroad (EP & SW) during 1911 and 1912.

The site is approximately 345 feet (105 meters) in diameter and lies west of the EP & SW railroad right-of-way in Section 10, Township 18 South, Range 20 East, in a relatively flat but heavily dissected and eroded area at the toe of the Whetstone Mountain bajada. Vegetation includes mesquite, whitethorn and catclaw acacia, creosotebush, yucca, and native grasses. Old Pueblo Archaeology Center defined the boundary of the site as the extent of the artifact scatter. Depth is uncertain, but buried cultural materials are probably limited to artifacts discarded on the surface and later covered by alluvium. The site appears to be in relatively good condition, although refuse deposited in washes has been scattered downslope by erosion.

The possible tent base consists of a flat area with a rectangular alignment of small rocks that measures 10 to 12 feet on a side. A wooden stake has been driven into the ground near the rock alignment and apparently was used to stabilize a cabin-style tent. The pile of concrete may indicate that the occupants of the site were mixing and pouring cement for the construction of a series of concrete culverts that carry water underneath the railroad bed during flood events, but that some of their materials were ruined by weather before they could be used.

The site contains an estimated 1,000 artifacts, including the above-mentioned forms of bags of hardened cement; hole-in-top food cans; tobacco cans; brown, green, and sun-colored amethyst glass bottle fragments from beer, condiment, medicine, and other bottles; nails; milled lumber; machined parts; harness parts; and so forth. Makers' marks noted include American Bottle Company bottles with 1909 and 1910 manufacturing dates.

Eight percent of this site is within the APE as currently defined and shown on **Figure 2**.

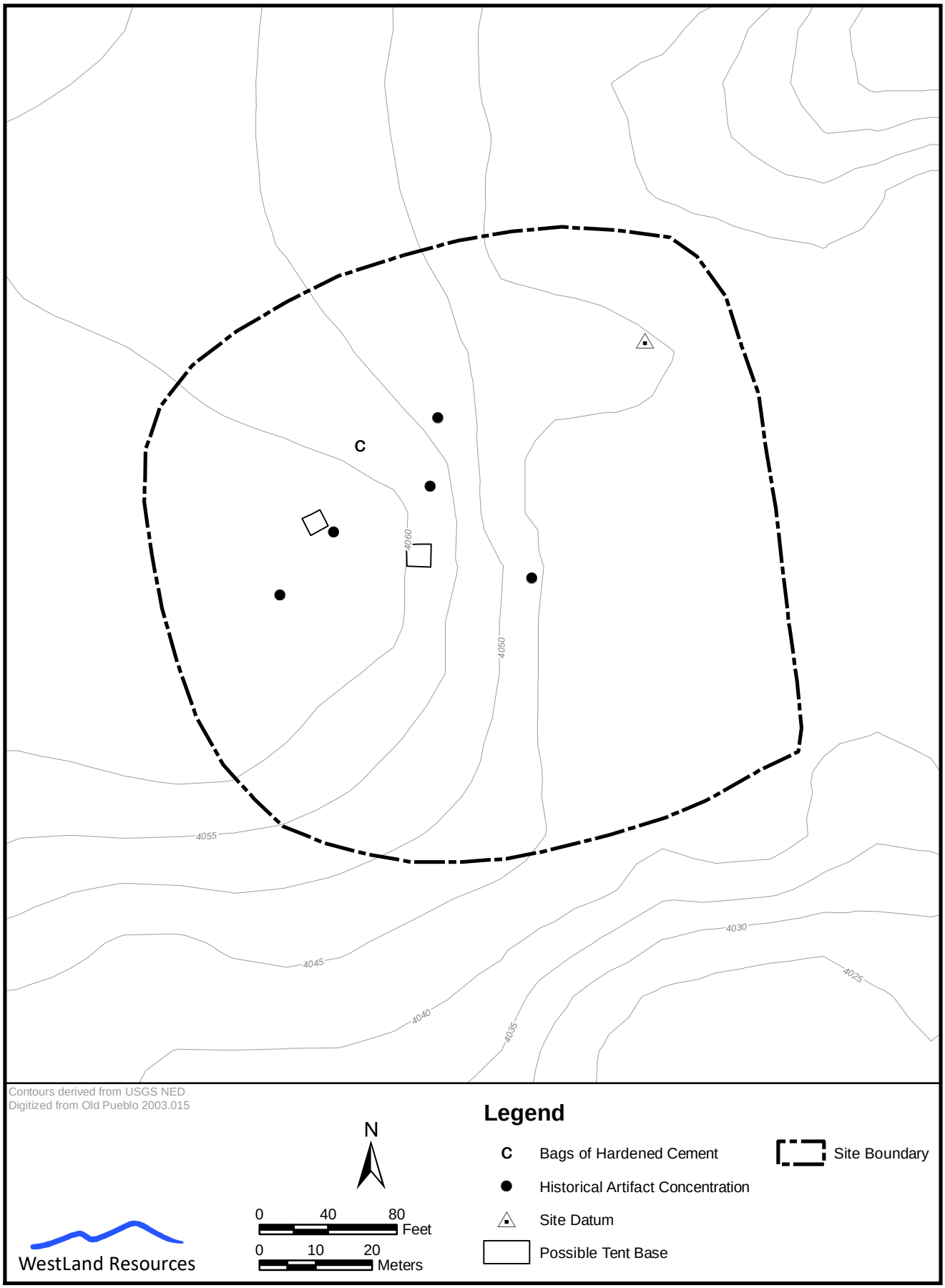


Figure 3. AZ EE:3:57(ASM)

AZ EE:3:166(ASM)

- Ezzo and Euler 2004b

AZ EE:3:166(ASM) **(Figure 4)** is a large scatter of historical artifacts and at least three areas where the presence of rock alignments and iron or wooden stakes suggests tents were placed. The site is interpreted as a work camp for the construction of the EP & SW during 1911 and 1912.

The site measures approximately 1,300 by 1,400 feet (396 by 427 meters) and lies in Section 10, Township 18 South, Range 20 East, on both sides of the EP & SW right-of-way just north of where the railroad crossed a heavily dissected and eroded area at the toe of the Whetstone Mountain bajada. Vegetation includes creosotebush, mesquite, whitethorn and catclaw acacia, yucca, and native grasses. Old Pueblo Archaeology Center defined the site as the extent of the artifact scatter. Depth is uncertain, but buried cultural materials are probably limited to artifacts discarded on the surface and later covered by alluvium.

The three possible tent bases consist of flat areas with rectangular alignments of small rocks that measure 10 to 12 feet on a side. Wooden stakes, an iron pipe, and iron rods have been driven into the ground in areas outside the rock alignments, apparently as stakes to stabilize a cabin-style tent or something similar.

Over 2,000 artifacts are estimated to be within the site. These include hole-in-top food, tobacco, cocoa, and malt cans; biscuit tins; brown, green, and sun-colored amethyst glass bottle fragments from beer, condiment, medicine, and other bottles; nails; milled lumber; machined parts; harness parts; and so forth. Makers' marks noted include several American Bottle Company bottles with 1909 and 1910 manufacturing dates (Toulouse 1972:30) (Jones and Dart 2003:13).

Twenty-six percent of this site falls within the APE.

Figure 4. AZ EE:3:166(ASM)

AZ EE:3:168(ASM)

- Ezzo and Euler 2004b

AZ EE:3:168(ASM) **(Figure 5)** is a large scatter of historical artifacts and at least four areas where the presence of rock alignments and iron stakes suggests tents were placed. The site is interpreted as a work camp for the construction of the EP & SW during 1911 and 1912.

The site measures approximately 860 by 616 feet (262 by 188 meters) and lies along the boundary of Sections 10 and 15, Township 18 South, Range 20 East, on the western side of the EP & SW right-of-way just south of where the railroad crossed a heavily dissected and eroded area at the toe of the Whetstone Mountain bajada. Vegetation includes creosotebush, mesquite, whitethorn and catclaw acacia, yucca, and native grasses. Old Pueblo Archaeology Center defined the boundary of the site as the extent of the artifact scatter. Depth is uncertain, but in at least one area a large concentration of historical trash and coal cinders suggests that buried cultural materials may be present. In other areas of the site, buried materials are probably limited to artifacts discarded on the surface and later covered by alluvium. The site appears to be in relatively good condition, although refuse deposited in washes has been scattered downslope by erosion.

The four possible tent bases consist of flat areas with rectangular alignments of small rocks that measure 10 to 12 feet on a side. Metal pipes or solid rods have been driven into the ground in areas outside the rock alignments, apparently as stakes to stabilize a cabin-style tent or something similar. The coal cinders probably were cleaned from a forge, suggesting that blacksmithing was performed at the site.

An estimated 1,500 artifacts were noted on the site surface. These include hole-in-top food, tobacco, cocoa, and malt cans; biscuit tins; brown, green, and sun-colored amethyst glass bottle fragments from beer, condiment, medicine, and other bottles; nails; milled lumber; machined parts; harness parts; and so forth. Makers' marks include several American Bottle Company bottles with 1909 and 1910 manufacturing dates (Toulouse 1972:30). Also present is a concentration of worn-out Fresno scraper parts, suggesting that one function of the camp was to repair earth-moving equipment (Jones and Dart 2003:14).

Two percent of this site falls within the APE.

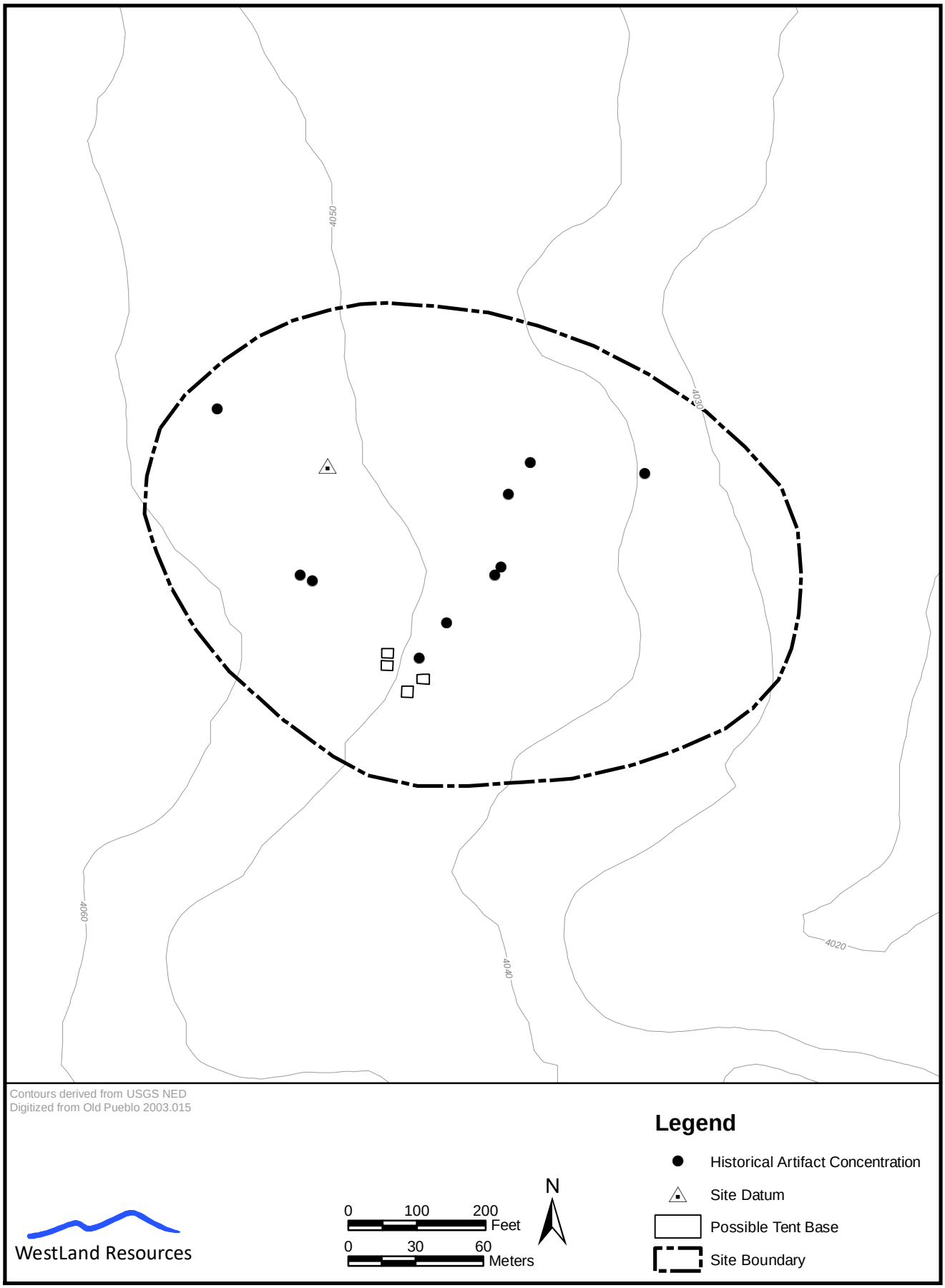


Figure 5. AZ EE:3:168(ASM)

Prehistoric Period Sites

The site descriptions for the prehistoric sites appear below.

AZ EE:3:172(ASM)

- Ezzo and Euler 2004b

AZ EE:3:172(ASM) **(Figure 6)** is a flaked and ground stone artifact scatter that is located on the southern side of a wide, flat wash on the middle bajada of the Whetstone Mountains in Section 7, Township 18 South, Range 20 East. The site is interpreted as a resource-gathering and processing site used during the Middle and Late Archaic periods between 5000 and 800 B.C.

The site measures approximately 240 by 130 meters and lies on an eroded but relatively level area of sandy silt and lag cobbles. Vegetation includes mesquite, whitethorn and catclaw acacia, yucca, and native grasses. Old Pueblo Archaeology Center defined the boundary of the site as the extent of the artifact scatter. Depth is uncertain, but five handstones are just becoming visible in what appears to be a cache pit, so buried cultural materials may also be present in other areas of the site. Archaic storage pits often expand at their base, giving them a "bell" shape and can exceed 1 meter in depth. The site appears to be in good condition.

The five handstones were in a cluster approximately 15 meters in diameter and were found just beginning to erode out of what appeared to be a cache pit. The presence of cached ground stone tools suggests that the site was a resource-gathering and processing area used repeatedly over time, or possibly even a semi-permanent settlement. Chronologically diverse projectile points suggest that it was used repeatedly by nomadic hunter-gatherers, so the probability of buried human remains is moderate.

Artifacts associated with the site include approximately 50 chipped stone flakes, 11 whole or partial handstones, 5 metate fragments, 4 retouched flakes, 11 side or end scrapers, and 3 projectile points. Side scrapers were used mainly for hide processing, while end scrapers were used for hide and plant processing (Sliva 1997), suggesting that both hunting and plant-food processing were taking place. The projectile points consist of a Pinto-style point manufactured during the Middle Archaic period between 5000 and 1500 B.C.; a San Pedro-style point manufactured during the San Pedro phase of the Late Archaic period between 1500 and 800 B.C. (Sliva 1997:50–51); and a laurel-leaf-shaped projectile point or biface of indeterminate origin (Jones and Dart 2003:16).

Thirty-nine percent of this site falls within the APE.

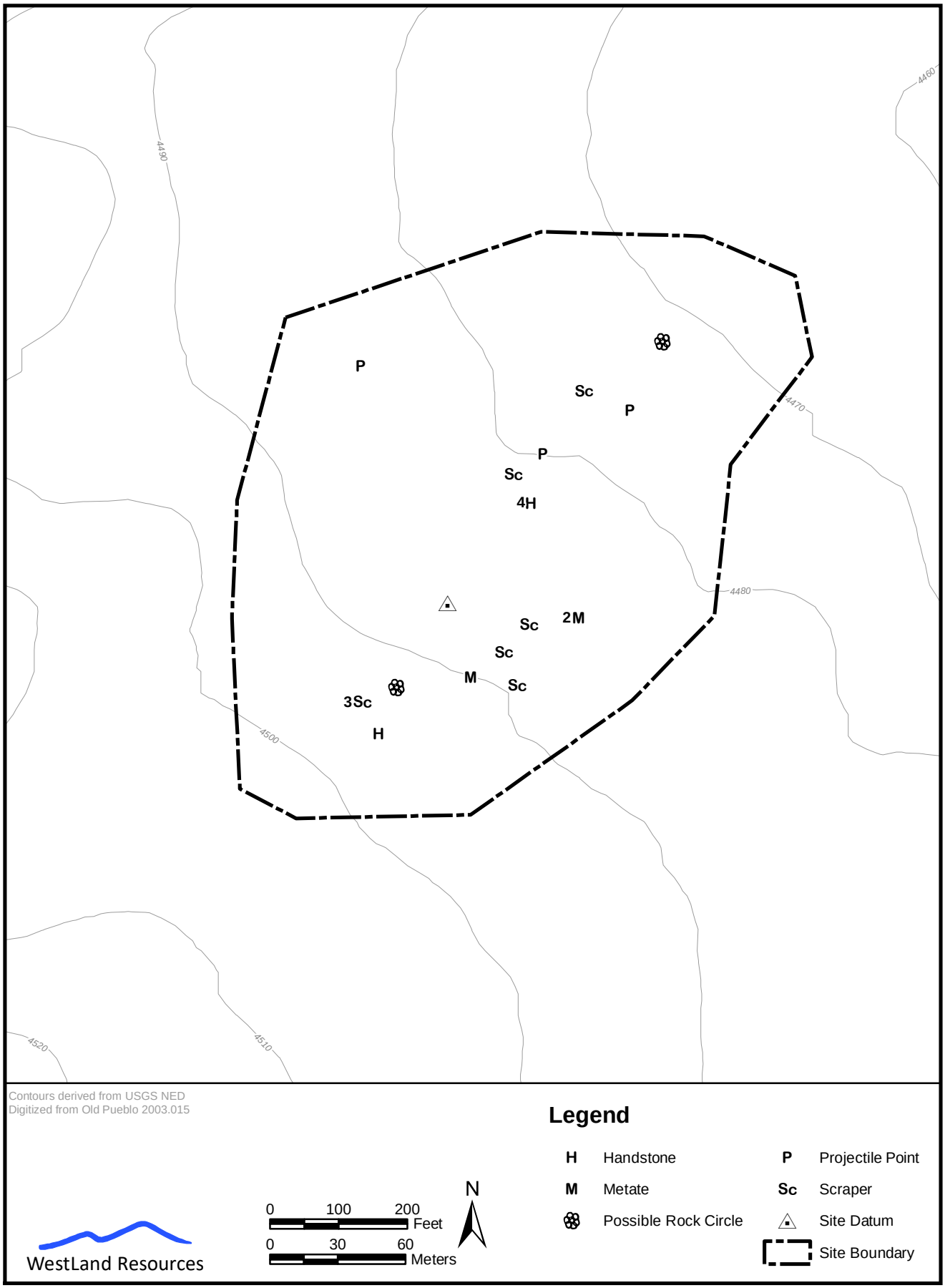


Figure 6. AZ EE:3:172(ASM)

AZ EE:3:173(ASM)

- Ezzo and Euler 2004b

AZ EE:3:173(ASM) **(Figure 7)** is a flaked and ground stone artifact scatter located on the southern side of a wide, flat wash on the middle bajada of the Whetstone Mountains in Section 8, Township 18 South, Range 20 East. The site is interpreted as a resource-gathering and processing site used during the Archaic period between 5000 B.C. and A.D. 150.

The site measures approximately 60 by 40 meters and lies on an eroded but relatively level area of sandy silt and lag cobbles. Vegetation includes mesquite, whitethorn and catclaw acacia, yucca, and native grasses.

Old Pueblo Archaeology Center defined the boundary of the site as the extent of the artifact scatter. Depth is uncertain, but given the age of the site the presence of buried cultural deposits cannot be ruled out. The site appears to be in good condition; however, it seems only to have been used on a limited basis by nomadic hunter-gatherers, and thus the probability of buried human remains is low.

Artifacts associated with the site include about 25 chipped stone flakes, 1 slab metate, 1 handstone fragment, and 1 reworked Archaic projectile point of indeterminate style (Jones and Dart 2003:16–17).

None of this site is within the APE.

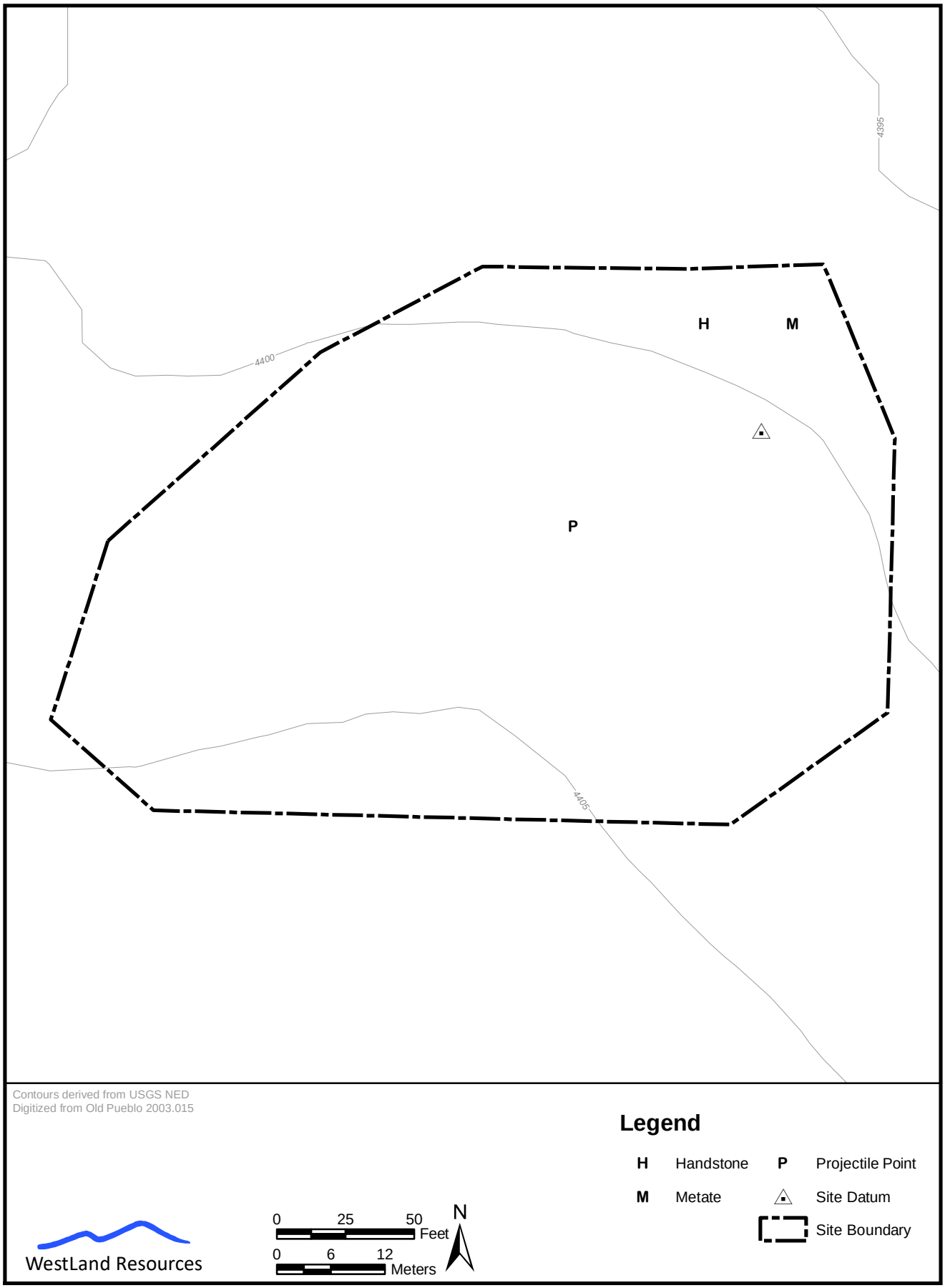


Figure 7. AZ EE:3:173(ASM)

AZ EE:3:175(ASM)

- Ezzo and Euler 2004b

AZ EE:3:175(ASM) **(Figure 8)** is a light scatter of prehistoric artifacts on a low ridge between and just upslope of the confluence of two small washes in Section 17, Township 18 South, Range 20 East. The site is interpreted as a resource-gathering camp used by Hohokam people between A.D. 650 and 1450.

The site measures approximately 90 by 45 meters and lies on a low ridge between two small washes, just upslope of their confluence. Vegetation includes mesquite, whitethorn and catclaw acacia, yucca, and native grasses. Old Pueblo Archaeology Center defined the site's northern, southern, and eastern boundaries as the edges of the ridge. The western boundary was defined as the end of the artifact scatter. Depth is uncertain, but given the generally deflated nature of the area, buried cultural materials can only be expected in areas where cobble lag deposits have retained alluvium. The site is somewhat deflated but generally in good condition.

No in situ archaeological features were visible and no evidence of permanent or extended temporary habitation was found. Thus the probability of the presence of buried human remains is extremely low.

Artifacts associated with the site include about 20 chipped stone flakes, 4 plain ware sherds, 3 handstone fragments, 1 slab metate fragment, 1 side scraper, and 1 thumbnail-style scraper. None of the sherds are larger than a U.S. quarter-dollar and all appear to be of Hohokam manufacture (Jones and Dart 2003:17).

Seven percent of this site falls within the APE.

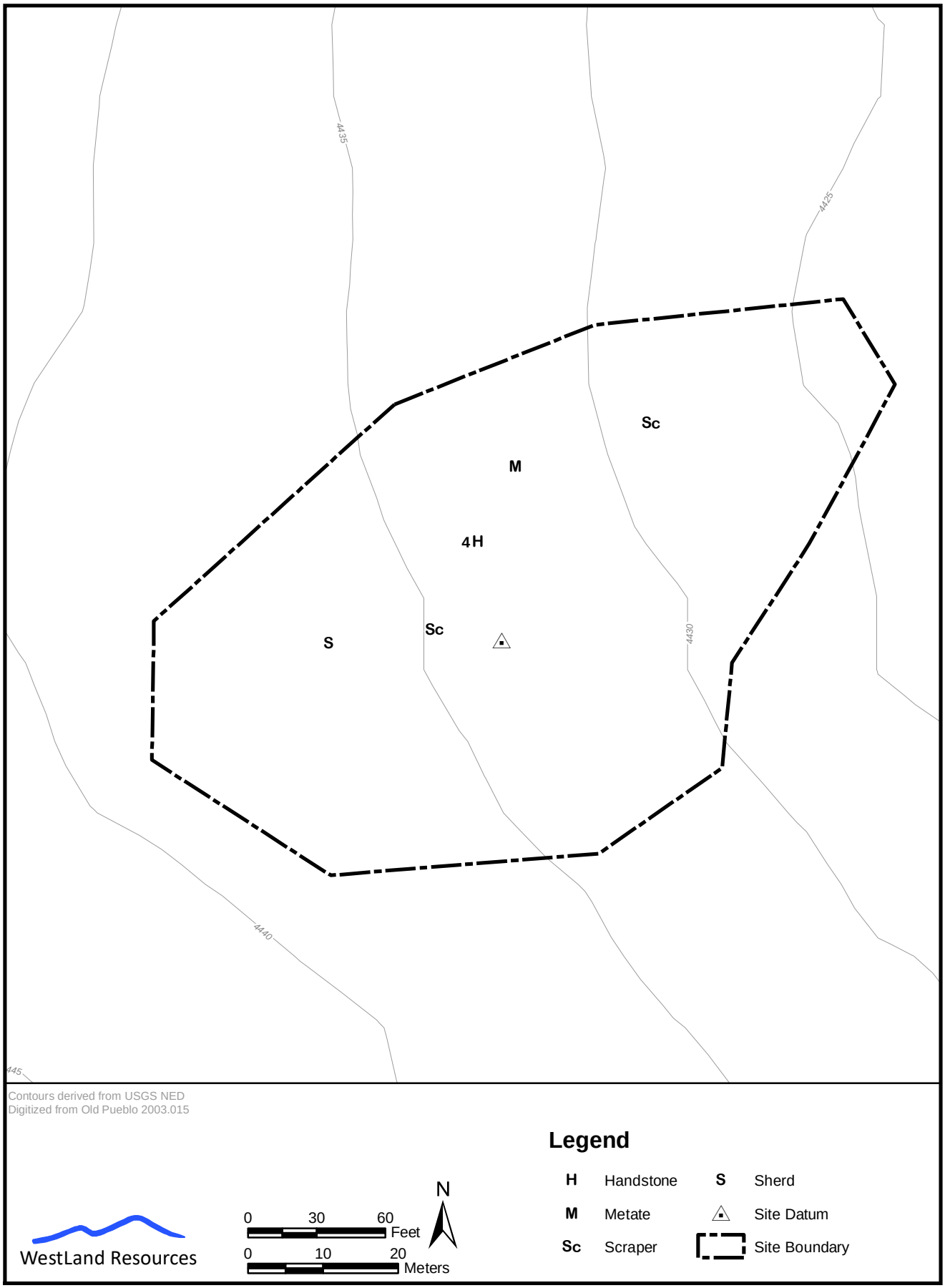


Figure 8. AZ EE:3:175(ASM)

CHAPTER 3: RESEARCH DESIGN

The following outline of the cultural history of southern Arizona establishes the scientific context within which the archaeological studies of the sites described in this report will proceed. This is followed by specific research themes appropriate to the study of the Archaic, Formative, and Historic period sites that are the subject of this data recovery plan.

ARCHAEOLOGICAL BACKGROUND OF THE SURROUNDING REGION

Cultural Background for Central and Southern Arizona

Archaeological evidence indicates that throughout prehistory and history, waves of cultural change swept across the Southwest, resulting in shared cultural practices and technologies among peoples across a broad region. In constant opposition to these shared similarities were regionally and locally unique expressions of cultural identity. This blending and annealing of indigenous and exogenous cultural forces created unique expressions of human culture across the landscape. The following is an attempt to formulate a perspective on the prehistory of central and southern Arizona by considering it as an integrated region. The discussion is presented with regard to five main periods: Paleoindian, Archaic, Formative, Protohistoric, and Historic. This discussion encompasses the region drained by the Salt and Gila Rivers within the Basin and Range geological province of central and southern Arizona.

Paleoindian Period (pre-8500 B.C.)

The first inhabitants of southern Arizona are referred to by archaeologists as Paleoindians. They were a migratory, nomadic hunting people who roamed across North America at the end of the Pleistocene epoch and the beginning of the Holocene epoch (Mabry 1998:7). Two diagnostic characteristics of Paleoindians are large fluted lanceolate projectile points and the association of these points with the fossil remains of now extinct animals, particularly mammoth (*Mammuthus* spp.) and ancient bison (*Bison antiquus*) (Reid and Whittlesey 1997:30–37). While originally conceptualized as purely "big-game hunters," some Paleoindians are now known to have exploited plant resources in ways akin to later Archaic peoples (Mabry 1998:64, 105–107; Reid and Whittlesey 1997).

The oldest evidence of human occupation in the Southwest is attributed to the Clovis complex. This complex is identified by a distinctive lanceolate spear point with a concave base, longitudinal fluting, and lateral and marginal grinding (Slaughter 1992:72). Several important Clovis sites are located just to the south of the APE in the upper San Pedro Valley of southeastern Arizona, including Naco, Lehner, Escapule, and Murray Springs (Faught and Freeman 1998:41). Much of the evidence of a Clovis presence in Arizona comes from isolated occurrences of Clovis points (either whole or in fragments); for example, such points have been found in the St. Johns and Winslow areas; in Saguaro National Park East and Willow Springs in the Tucson Basin; in the Avra Valley area west of the Tucson Basin; near Kartchner Caverns just west of the APE; along

Big Wash near Oracle Junction; in the area south of Gila Bend; on the northwestern bajada of the Pinaleño Mountains; and in the Sanchez area in the Safford Valley (Ayres 1970; Faught and Freeman 1998:44; Huckell 1982; Neily 1985:10; Seymour et al. 1997:1–8).

The Folsom complex succeeded the Clovis complex. Folsom, like Clovis, is identified by a distinctive style of projectile point. Folsom points are also lanceolate fluted spear points; however, Folsom points are distinguished from Clovis points by the extent of the fluting, which extends the full length of the blade, from the proximal end to the distal end. In addition, the margins of these points were retouched after fluting. In Arizona, Folsom points have been found only in surface contexts on the Colorado Plateau and in the mountainous Mogollon Rim country. No Folsom points have been identified in southern Arizona (Faught and Freeman 1998:45).

Plainview is a third Paleoindian tradition or tool complex that has been identified on the Colorado Plateau and in the southern Basin and Range province (although not, to date, elsewhere in Arizona). The Plainview tradition is attributed to the late Pleistocene or early Holocene period. Plainview points consist of several subtypes, including Meserve, Milnesand, and Belen points. All these points resemble Clovis points in their basic configuration, but they are unfluted (Faught and Freeman 1998:47). A Plainview point was discovered on the bajada of the Winchester Mountains in the Sulphur Springs Valley (Carlson et al. 1989). A few fragmentary projectile points resembling the Plainview type have also been found on the eastern Santa Catalina bajada in the interior of the Tortolita Mountains (Huckell 1984). Later Paleoindian complexes have not been identified anywhere in southern Arizona (Faught and Freeman 1998).

Archaic Period (8500 B.C.–A.D. 1)

The Archaic period was characterized by the collecting of a broad spectrum of wild plant and animal resources for subsistence. The large Pleistocene animals hunted in the Paleoindian period had become extinct by the beginning of the Archaic period, although it has been suggested that the two subsistence strategies overlapped temporally and possibly spatially (Faught and Freeman 1998:50). The hunting of megafauna may have been an opportunistic component of what was otherwise a subsistence strategy resembling that typified by the term *Archaic*. Nevertheless, a rough temporal marker of 8500–8000 B.C. has been chosen as the starting point of the Archaic period, as it was around this time that a ground stone tool industry consisting (initially) of one-handed manos and slab metates became common across the Southwest (Huckell 1996:306, 327). This has been taken to imply that many plant resources (seeds in particular) were not exploited by people using Paleoindian subsistence strategies, and that the beginning of the Archaic period marks a broadening of the resource base.

The phrase *Archaic period* refers both to a division of time and the lifeway practiced by the ancient peoples during that time. Geographically, the period of time designated by archaeologists as the Archaic period is subdivided into several regions spanning the Southwest as a whole. In the southern Basin and Range region of the Southwest, the broad cultural manifestation termed *the Archaic* is known as the Cochise culture. This culture is distinguishable from four co-traditions:

the Colorado Plateau/Great Basin Complex, the Oshara Tradition, the Armagosa, and the Chihuahua Tradition. Temporally, the Cochise culture is subdivided into three broad divisions: Early, Middle, and Late.

The Early Archaic period (ca. 8500–6000 B.C.) of the Cochise culture is known as the Sulphur Springs phase. Sayles and Antevs (1941) originally defined this phase in the Sulphur Springs Valley approximately 35 miles east of the APE near Willcox (Reid and Whittlesey 1997:44). Their archaeological work took place prior to the advent of radiocarbon dating techniques, so there was no independent chronological evidence for dating this early Cochise manifestation. The absence of independent dates contributed to Sayles originally concluding that a Paleoindian tradition (typified by the exploitation of megafauna) co-existed with a hunting-and-gathering tradition that exploited smaller game and various plant resources, as reflected in an artifact assemblage composed of flat milling stones, unifacial scrapers, and other lithic implements. This assessment turned out to be incorrect; however, re-examination of the Sulphur Springs material did establish a reliable beginning date of ca. 8500 B.C. for the Sulphur Springs phase (Huckell 1996:339). Even though they have now been dated with certainty, the sites investigated by Sayles did not include any artifacts that were stylistically distinctive and thus temporally diagnostic. Diagnostic projectile points are lacking from Early Archaic sites in southern Arizona that can be directly correlated in time with the Sulphur Springs phase, and sites dating to this era are not always recognizable without direct methods of dating such as radiocarbon (Huckell 1996:329).

The Middle Archaic period (ca. 6000–1200 B.C.) of the Cochise culture—known as the Chiricahua phase—is typified by the addition of shallow basin metates, mortars and pestles, various bifacial tools, and distinctive side-notched projectile points (Chiricahua points) to the overall tool assemblage (Freeman 1999; Huckell 1996:342; Mabry 1998). Generally, the Middle Archaic period was a time during which regional variations in the material culture across the Southwest became less pronounced. In particular, projectile points took on a similarity of design over large geographic regions (Mabry 1998). Chiricahua points, for example, are similar in style and manufacture technique to Northern Side-notched, Pinto, and San Jose points, all found in other parts of Arizona (Slaughter 1992:70). It is during the Middle Archaic period that evidence of permanent or semi-permanent domestic architecture appears, although bands of people probably remained highly mobile. The first Mesoamerican cultigens (including maize) also arrived in the Southwest during this period, perhaps as early as 2000 B.C. (Huckell 1996:343; Mabry 2005:114).

The Late Archaic period (ca. 1200 B.C.–A.D. 1) appears to have been a time of increasing adaptation to agriculture as the primary subsistence strategy. The prevalence of maize agriculture has led some researchers to refer to this period as the Early Agricultural period (Huckell 1996). It remains unclear whether the adoption of agriculture along with its corresponding changes in social and political relationships and settlement patterns occurred simultaneously across the Southwest. The earliest direct dating of maize from various parts of the Southwest suggests an essentially contemporaneous adoption of this cultigen about 4,000 years ago (Mabry 2005). However, adaptations to this early agricultural product were not the same in all regions, with many people

retaining a way of life that could continue to be characterized as Archaic (Diehl 2005; Huckell 1996). Hunting-and-gathering practices remained a vital subsistence strategy throughout the Late Archaic/Early Agricultural period as seen in the macrobotanical, zooarchaeological, and human osteological record (Diehl 2005:182). Additional evidence suggests that some groups did not cultivate maize at all. The Coffee Camp site, for instance, at the southern edge of the Santa Cruz Flats provides evidence of a semi-sedentary lifestyle coupled with a continued reliance on wild plant and animal resources (Halbirt and Henderson 1993 [eds.]).

In the south, the Cochise culture entered its penultimate cultural stage, the San Pedro phase (1500–800 B.C.). This name derives from the type-site first investigated by Sayles near the present APE on the San Pedro River (Sayles and Antevs 1941). Apart from its distinctive corner- and side-notched projectile points, the San Pedro phase is typified by 1) small oval pithouses, often with large interior bell-shaped storage pits and similar extramural pits (both of which reflect the importance of storage in a subsistence economy that includes the growing of crops); 2) flexed inhumations; 3) refinements in ground stone technology; and 4), in the Santa Cruz River Valley, canal-irrigated farming. Also notable during the Late Archaic period was a ceramic tradition of figurines, beads, and miniature vessels (Heidke 2005; Stinson 2005). Although the miniature vessels are argued to be incipient pottery (Heidke 2005), these objects have decorative qualities reminiscent of baskets and are similar to the ceramic effigies found in Early Formative period contexts at other sites (Haury 1976). Late Archaic incipient pottery may be part of this ceramic effigy tradition.

Until relatively recently, the San Pedro phase was considered the final stage of the Cochise culture. Archaeological work in Tucson and other areas, however, has led to the definition of an additional phase, the Cienega phase, for the final pre-ceramic stage of the Cochise culture in southern Arizona (Gregory 2001:253; Huckell 1996:345). The Cienega phase, in contrast to the earlier San Pedro phase, is characterized by round, rather than oval, pithouses; distinctive projectile points with deep diagonal corner-notching (Cienega points); and a more diverse ground stone artifact assemblage (Huckell 1996:345; Stevens and Sliva 2002:300). Dates proposed for this phase are ca. 800 B.C.–A.D. 150 (Gregory 2001).

Formative Period (A.D. 1–1450)

Hohokam

The Formative period is differentiated from the Archaic period by the addition of pottery to the material culture repertoire. The Formative period in southern and central Arizona is typically considered synchronous with the tenure of the Hohokam culture. This may or may not be the case (see Deaver and Ciolek-Torrello 1995; Di Peso 1956). The conventional wisdom that the Hohokam cultural tradition begins with the appearance of pottery in central and southern Arizona still needs to be researched and evaluated. Although this has been the standard for most archaeologists, an alternative rubric is available, one that divorces itself from the developmental dynamics of a specific culture area by instead linking its divisions to cultural processes, trends, and events that occur synchronously across a broad area.

The Hohokam culture is segmented into a sequence of four cultural periods. From oldest to youngest, these are the Pioneer, Colonial, Sedentary, and Classic periods (Gladwin 1965; Haury 1976, 1978). In their original formulation, these periods represent the thesis that the Hohokam culture derives from Mesoamerican immigrants who "pioneered" a new way of life in the Gila and Salt River Valleys of Arizona. After a few centuries of development, the descendants of the original immigrants "colonized" most of the adjoining river valleys of central and southern Arizona using their sophisticated technological, social, political, and religious systems. Once in place, the Hohokam colonists became "sedentary" agriculturalists. In a few centuries, the Hohokam culture reaches its zenith, or "classic" cultural development.

The Hohokam cultural sequence was formulated on the notion that the river valleys radiating outward from the Gila and Salt Rivers were uninhabited or that the bottomlands were not utilized by the indigenous Archaic peoples. An alternative model for southern Arizona was formulated by Di Peso (1956), who postulated that the river valleys were already inhabited by agricultural peoples that he referred to as the O'otam who were subjugated by the Hohokam. Di Peso's scenario also recognizes that after a few centuries of oppression under Hohokam dominance, the O'otam people re-asserted themselves and ended the Hohokam reign.

Salado

For nearly a century, Arizona archaeologists have debated the evidence for and against a distinct Salado culture, and it seems probable that this debate will continue. Archaeologists Harold and Winifred Gladwin from Gila Pueblo first proposed the Salado as a distinct archaeological culture who had migrated to or "invaded" the Tonto Basin by A.D. 1200 (Gladwin and Gladwin 1935). Gladwin (1928) first introduced this theory in a summary of the excavations at Casa Grande, although the term "Salado" did not appear in the report. He (1928:27) theorized that "too many changes took place at this time to be accounted for by normal progress and the suggestion is offered that the advent of polychrome ware indicates a successful invasion which was followed by sweeping changes in pottery, architecture and burial customs." He (1957) further defined the Salado culture as "polychrome, black-on-white, polished red ware, and corrugated plain ware pottery; puebloan architecture associated with coursed masonry or solid adobe construction, cliff dwellings, and compounds or defense walls; storage pits; sheet rubbish deposition (no mounds); and primary inhumation for disposal of the dead" (Weaver 1976:19). This definition of Salado was supported by Emil Haury's 1934 dissertation work (Haury 1945), which reviewed the excavations at Los Muertos (AZ U:9:47[ASM]) by Frank Cushing.

In the 1960s, a new generation of archaeologists postulated that the Salado did not represent an invasive puebloan culture related to the Mogollon people but was a local development of the Hohokam culture (Reid and Whittlesey 1997; Wasley 1966). In the decades that followed, archaeologists proposed numerous perspectives on the Salado (Stark et al. 1995), including Salado as a unique regional culture (Doyel 1978; Hohman 1992; Whittlesey and Reid 1982), a migrant people (Franklin and Masse 1976), an offshoot of the Hohokam culture (Doyel 1976), a blending

of Hohokam and Sinaguan cultural traits (Schroeder 1953), an intermingling of Hohokam, Mogollon, and Anasazi cultural traits (Reid and Whittlesey 1997), a "weakly integrated system of exchange among a large series of small-scale regional systems" (Wilcox and Sternberg 1983:244), the expression of a "new religious ideology," the Southwestern Regional Cult (Cordell and McBrinn 2012:259; Crown 1994), and a fourteenth-fifteenth century ceramic horizon (Lekson 2002). What archaeologists can agree upon is that the defining trait of the Salado—Salado Polychrome ceramics—is found not just within the Tonto Basin, but throughout central Arizona, western New Mexico, Chihuahua, Mexico, and El Paso, Texas (Cordell and McBrinn 2012:258). This area encompasses the regions to the northeast, east, and southeast of the Hohokam and generally includes the Verde River Valley, the Tonto Basin, the Gila River Valley above the Buttes near Florence, and much of southeastern Arizona.

Recent speculation about the Salado has led to a return to the modified migration model (Clark 1995; Elson et al. 2000; Rice 1998; Stark et al. 1995; Whittlesey and Ciolek-Torrello 1992; Woodson 1999, 2006). Current thinking places the beginnings of the Salado culture in the Tonto Basin during the Roosevelt phase (A.D. 1250–1350). It now appears that Puebloan peoples migrating from the north established themselves amongst the Hohokam-influenced peoples of the basin at this time. From the interaction of these two groups, a new village type emerged that consisted of above-ground residential compounds clustered around platform mounds (Elson et al. 2000; Reid and Whittlesey 1997). At the same time, manufacture of the Salado Polychromes began. It is now believed that these changes signaled the incipience of a new socioeconomic, political, and religious system designed to cope with the integration of disparate migrating groups settling amongst the Hohokam peoples of central and southern Arizona. It is this new system, born of a meeting of Puebloan and Hohokam cultures, that we now call Salado. This system has been characterized as a new culture, but may be better thought of as a manifestation of a new regional ideology designed to frame interactions in multi-ethnic societies (Crown 1994).

Mogollon

Following the Archaic, the Mogollon of east-central Arizona and southwestern New Mexico developed into a unique culture, albeit one exhibiting regional variants in the material culture in the Mimbres, San Simon, Black River, Forest Dale, and Cibola areas. The Pit House period (A.D. 200 to circa A.D. 1000) of the Mogollon spans the middle two thirds of the Early Formative period through the middle part of the Middle Formative period. The trend toward agriculturally dependent sedentary societies was essentially complete across most of southern Arizona by the Middle Formative period. Settlements were located in two general zones: along rivers and at the mountain fronts. Agricultural products were clearly the mainstay of the subsistence economy—principally the triumvirate of maize, beans, and squash—but foraging for native foods and the hunting of small and large mammals remained an important aspect of the subsistence regime. Despite similarities in the general pattern, local and regional variations persisted. The repertoire of food-producing and food-gathering techniques was sufficiently diverse and the level of social organization sufficiently well developed to allow groups to adapt to a variety of environments.

In southeastern Arizona, "mixed" Hohokam and Mogollon cultural traits may indicate an amalgam of several distinct cultures or, alternatively, of sequential occupation or co-residence by diverse cultural groups, as suggested by the mixed ceramic assemblages, Mogollon- and Hohokam-style pithouses, and inhumations and cremations at sites such as Second Canyon Ruin (Whittlesey and Heckman 2000:10). At the Mescal Wash site, a similar co-occurrence of traits was observed by Deaver (2010:6–13).

The middle San Pedro region is located between the traditionally defined peripheries of the Hohokam and Mogollon cultural regions. During the Middle Formative period in the San Pedro River Valley and adjacent areas, the Dragoon culture emerged. This culture was an apparent variation of the San Simon Branch of the Mogollon (Heckman 2000:43–62), the prehistoric people inhabiting the mountainous regions of central Arizona and west-central and southwestern New Mexico (Reid and Whittlesey 1997). This variation is considered to be the result of a strong Hohokam influence on the San Simon peoples inhabiting the middle and upper San Pedro River Valley between A.D. 700 and 1100 (Heckman 2000:43–45; Vanderpot and Altschul 2007:61–62; Whittlesey et al. 1994:65–82).

Protohistoric Period (A.D. 1450–1691)

Between the collapse of the prehistoric cultures at the end of the Late Formative period (ca. A.D. 1450) and the Spanish *entrada* in 1539, there appear to have been significant changes in the Native American cultures in the region. Very little is known about this period prior to the arrival of Father Kino in the Santa Cruz River Valley in A.D. 1691. The Spanish identified the peoples living along the Santa Cruz and Gila Rivers as the Pima (O'odham) and those along the San Pedro River as the Sobaipuri (Doelle and Wallace 1990; Masse 1981). The people in the Papaguería also spoke a dialect of the Piman language and were known by the Spanish as the Papago. They are now known by the name Tohono O'odham. The Piman-speaking peoples of central and southern Arizona were in conflict with the Apachean bands that were migrating south from northeastern and east-central Arizona and with the Yavapai bands of central Arizona.

The Spanish Entrada

Spanish exploration of the Southwest began as early as 1539 with the preliminary scouting expedition of Fray Marcos de Niza, who had been sent to the region by Mexican viceroy Antonio de Mendoza in response to the accounts of Alvar Núñez Cabeza de Vaca and Moroccan slave Estevan. Cabeza de Vaca and Estevan had wandered to Sonora after being shipwrecked in the Gulf of Mexico in 1528. After de Niza returned, Viceroy Mendoza proposed a larger expedition and selected Vásquez de Coronado as its leader. Coronado's party departed in 1540 in search of the fabled Seven Cities of Cibola. The route of the expedition probably took Coronado through what is now eastern Arizona, although it has been speculated that one of the stops on the journey, Chichilticale or "Red House," was in fact the Hohokam adobe house at Casa Grande. A preliminary scouting party led by Melchior Diaz preceded Coronado up the San Pedro River and

explored the area around the Gila-San Pedro confluence to the "east and west." The exact extent of this survey is unknown, however (Wilson 1999:25–26).

The Spanish likely entered a world that had undergone traumatic social and environmental changes shortly before their arrival. When they arrived in the sixteenth century, much of the Southwest was subjected to regular warfare, and large areas were uninhabited. Captain Hernando de Alarçon, who was transporting supplies up the Colorado River for the Coronado expedition, was told by a native informant that the region between the Colorado River and Coronado's route was uninhabited (Wilson 1999:13). Similarly, Coronado found the region that is now eastern Arizona to be a great *despoblado*—an uninhabited region (Reid and Whittlesey 1997:165). Indeed, eastern Arizona had been minimally inhabited following the final abandonment of the pueblos. The precise route taken by the Coronado expedition is not known, but several routes have been hypothesized. The most commonly (and perhaps uncritically) accepted is that of Coronado biographer Herbert Bolton (Reid and Whittlesey 1997:267–273), who proposed that the expedition crossed the Gila River near Bylas and continued northerly across the Salt, White, and Little Colorado Rivers, finally arriving at Cibola—the Zuni village of Hawikuh—where the expedition's members were disappointed to find that the streets were not paved with gold.

The languages spoken by the indigenous peoples were one of the ways the Spanish explorers and missionaries used to identify the people living in southern Arizona and northern Sonora. Some of these people spoke closely related dialects of Piman, which belongs to the Uto-Aztecan linguistic family, while others spoke the Hokan (or Yuman) languages, which are unrelated to Uto-Aztecan. The Hokan speakers were primarily those inhabiting the areas along the lower Colorado River, but some resided alongside the Piman speakers on the Gila River, having migrated there in response to ongoing warfare (Reid and Whittlesey 1997:114). Hokan speakers included the Opas (much later known as the Maricopas) and the Kaveltcadom (or Cocomaricopas). Piman speakers included such groups as the Sobaipuris, Cipias (or Zipias), Ymiris (or Hymeris), and Kohatks (Wilson 1999:10).

Linguistically, there is a continuity between west-central Mexico and southern Arizona, one that may have existed prehistorically and been paralleled by some aspects of the material culture, notably the ballcourt (Kelley 1991). The languages or dialects spoken by both the Upper and Lower Pimans belong to Lowland Pima, one of four divisions of the Tepiman group of languages (itself belonging to the wider Uto-Aztecan family), the other three being Mountain Pima, Northern Tepehuan, and Southern Tepehuan (Saxton and Saxton 1973:xvii). The Tepehuan languages were spoken in the Zacatecas and Durango regions in west-central Mexico, whereas the Piman languages were spoken in northwestern Sonora/southern Arizona. This linguistic homogeneity, although quite possibly existing in prehistoric times, does not necessarily reflect a long, in-place population, although several linguists have concluded that the Uto-Aztecan family had been present in the Southwest since the Middle Archaic period (Mabry 1998). A second scenario that accounts for the distribution of the Tepiman languages in southern Arizona is the movement of the Piman speakers northward from homelands in northern Mexico (Teague 1993:437), presumably replacing the extant language or languages, which may themselves have belonged to the Tepiman group.

Historic Period (A.D. 1691–1950)

The Historic period begins in 1691 with the establishment of the mission system following the arrival of Jesuit missionary Eusebio Kino. Kino made his first forays into the Santa Cruz River Valley in 1691 (to Tumacácori) and 1692 (to San Xavier del Bac) (Wilson 1999:12–13). After a poorly documented visit to the Casa Grande area in 1694, Kino made a second *entrada* to the area in 1697 (Wilson 1999:24). Setting out from the Nuestra Señora de Dolores mission, Kino traveled north along the San Pedro River, followed the Gila River to the west, and arrived at Casa Grande on November 18, 1697. On this journey, he was accompanied by Captain Juan Mateo Manje and approximately 20 soldiers and native guides. Manje, unlike Kino, kept well-written journals of his travels, and his chronicle of this expedition makes note of small groups of people living along the San Pedro River, which he identified as the Sobaipuri (Doelle and Wallace 1990; Masse 1981). It also mentions many abandoned villages along the river corridor. These were most likely recently abandoned Sobaipuri villages, although he may have included prehistoric sites as well (Masse 1980). The chronicle also notes "six or seven" Piman *rancherías* along the Gila River in the area around Casa Grande. This appears to be the first known reference to the Pima by Europeans (Debowski et al. 1976:30).

The missionaries identified the groups of people inhabiting southern Arizona and northern Sonora as Upper and Lower Pimans, or *Pimas Altos* and *Pimas Bajos*. The *Pimas Altos*, or the people inhabiting the Pimería Alta, were divided by the Spanish missionaries into four broad groups: the Pima, inhabiting the southeastern portion of the Pimería Alta; the Papabotas, inhabiting the desert areas and later known as the Papago (and today as the Tohono O'odham); the Soba, supposed followers of a man named Soba in the southwestern Pimería Alta (and unlikely a distinct cultural entity); and the Sobaipuri, inhabitants of the north and northeastern areas, or the San Pedro and Santa Cruz River Valleys (Spicer 1962:119, 126–128; Wilson 1999:20). Subsistence strategies included the gathering of native resources (with wild melons and bighorn sheep being particularly important sources of food) and floodwater farming. It is uncertain whether irrigated agriculture was being practiced at this time (as it had been during the Hohokam era), although a 1699 account by Captain Manje states that the Pima did not use canals to irrigate their crops but relied on floodwater instead (Wilson 1999:38). However, people in the San Pedro River Valley are mentioned obliquely by Kino during an earlier visit as cultivating cotton by irrigated agriculture.

Two of the better known Sobaipuri sites, Quibari and Gaybanipitea, are located in the San Pedro River Valley near the APE. Although only briefly occupied (from 1692 to 1698), Quibari was the largest settlement along the San Pedro River at the time, with about 500 occupants at its peak (Altschul and Jones 1990). The two sites were excavated by Charles Di Peso, and European metal and glass were recovered from both. In addition, Sobaipuri Whetstone Plain Ware was recovered from Gaybanipitea. Other recovered artifacts of the Sobaipuri material culture included small serrated projectile points with deep basal notching and finely flaked unifacial and bifacial tools (Altschul and Jones 1990; Slaughter 1992:70–71).

Owing to the work of "Padre" Kino, missionary efforts in the Pimería Alta continued into the early eighteenth century. After Kino's death in 1711, however, the mission system in Sonora began to deteriorate, partly the result of neglect while Spain was fighting the War of the Spanish Succession (Walker and Bufkin 1979:14). In a 1723 report on the state of the mission system in Sonora, Fray Daniel Januske reported that the native population of the Pimería Alta was declining, the result of poor living conditions at the missions and Apache raiding. The Apache had begun raiding Piman settlements just prior to Kino's initial contact (Spicer 1962:234), and the increase in raiding over time resulted in more and more geographical shifts among the Piman-speaking populace. By 1750, most of the people occupying the San Pedro River Valley had been forced to move to the Santa Cruz and Altar Valleys. This turned out to be only a temporary solution, as the Apache began raiding those locations as well. In 1762, the remaining Sobaipuri populations were moved out of the San Pedro River Valley to replace Pima who had succumbed to disease at the Guevavi Mission in the Santa Cruz River Valley. These people either died or were absorbed into the Piman populace, thus ending the existence of the Sobaipuri as a distinct cultural group (Walker and Bufkin 1979:12).

Incursions by the Apache continued unabated. Beginning around 1790, as a means of bringing raiding to a halt, the Apache were provided with rations and supplies, an action by the Spanish government that allowed for the expansion of ranching and stock raising in what would eventually become southern Arizona. This time of relative peace ended with the independence of Mexico from Spain in 1821. With Spanish support no longer available, ranching became unviable as the Apache resumed their raiding activities (Morrisey 1950:151).

Anglo-Americans first established a substantial presence in the middle Gila River region during the period between Mexico's independence and the beginning of the Mexican-American War (1846). The first Americans to enter the area appear to have been Sylvester and James Ohio Pattie, father and son beaver trappers who made several trapping excursions along the San Pedro, Gila, and Colorado Rivers during the years 1825 and 1826 (Walker and Bufkin 1979:17). During the war itself, the "Army of the West" under the command of Colonel Stephen Watts Kearny was assembled at Fort Leavenworth, Kansas, for the conquest of the Southwest. The first expedition headed by Kearny passed along the Gila River in 1846. Reinforcements were sent to follow behind this force and included the Second Missouri Mounted Rifles and an infantry battalion of 500. This infantry, known as the Mormon Battalion, consisted of volunteer Mormons from Nauvoo, Illinois, who were intending to settle in Utah. The first commander of the battalion, Captain James Allen, died before reaching Santa Fe and was replaced by Captain Philip St. George Cooke. Cooke entered what is now Arizona through the Guadalupe Pass, marched up the San Pedro River to the Benson area, then turned west toward Tucson. From there, he continued up the Santa Cruz River and followed Kearny's previous route along the Gila River to California. Although temporary, this is perhaps the first instance of a Mormon presence in the San Pedro River Valley (Walker and Bufkin 1979:18).

The Treaty of Guadalupe-Hidalgo, signed in 1848 following the conclusion of the Mexican-American War, ceded that portion of (what is now) Arizona lying north of the Gila River to the United States. In 1853, the Gadsden Purchase expanded Arizona from the Gila River south to the

present-day Mexican border. Although the lands included in the Gadsden Purchase had been used for ranching in the past, Arizona's ranges were now open for ranching activities on a large scale. The increase in population in California since 1849 had resulted in a significant beef market, and Arizona became a thoroughfare for cattle driven from Texas to California. Within Arizona itself, military garrisons and a growing mining industry also provided a need for beef (Morrisey 1950:151–152). The U.S. Army arrived in Tucson in 1856, founding the original Fort Lowell southeast of an old Spanish presidio. Fort Lowell's main purpose was to protect settlers from the Apache. In 1858, the Butterfield Overland Mail Company was formed to provide stagecoach transportation and mail service from St. Louis, Missouri, through Arkansas, New Mexico, and Arizona, to San Francisco.

In 1863, the Arizona Territory was established after successful lobbying by Charles Poston. A year before, in 1862, the National Homestead Act offered land tracts of 160 acres at $1.25/acre or 80 acres at $2.50/acre for land within a railroad grant (Stein 1990:4). This began a series of homesteading acts that sparked a boom in homesteading in Arizona from 1910 to 1940 (Stein 1990).

The Southern Pacific Railroad (SPRR) arrived in 1880, bringing with it a flood of Anglo-American settlers. The surrender of Geronimo and the defeat of the Apache in 1886 initiated boom times in the region, with mining and cattle ranching as the main industries of growth (Sonnichsen 1987). Arizona became the 48th state in the Union on February 14, 1912.

Benson

The town of Benson, located approximately 10 miles north of the APE, was established in 1880 as the shipping point for Tombstone to the south when the SPRR came through southern Arizona. Benson was named for Judge William B. Benson of California, who was a friend of Charles Crocker, president of the railroad (Granger 1975).

Benson was also the location of the Benson smelter, one of the early principal lead smelters in southern Arizona. The Benson smelter was operated by the Benson Mining and Smelting Company and was blown in on September 28, 1882. The smelter operated for only 2 years before being dismantled and shipped to Mexico (Rickard 1987).

Benson was a central location for railroad construction and traffic. The New Mexico and Arizona Railroad ran from Benson to Fairbank to Calabasas and Nogales. Construction started in Benson in 1882, and the tracks had reached Nogales by 1884 (Irwin 1987). The Arizona and Southeastern Railroad Company was incorporated in May 1888. The railroad was completed from Bisbee to Fairbank in 1889 and then extended from Fairbank to Benson in 1894. The EP & SW was originally built in 1888–1889 by the Copper Queen Consolidated Mining Company, a subsidiary of Phelps Dodge, from Bisbee to connect to the Santa Fe's Arizona and New Mexico Railroad in Fairbank. In 1894, the EP & SW was extended to Benson to connect to the SPRR. The segment located in the APE is the Tucson extension that was constructed in 1911–1912. This segment was used for several decades, acquired by the SPRR in 1924, and abandoned in 1961. The track was removed prior to 1973. Benson was the only town in Arizona to ever be served by three lines.

RESEARCH THEMES

Research Theme 1: Archaic Period (8500 B.C.–A.D. 1) Utilization of the Development Property Area

There appears to have been little use of the 8,212-acre development property area by people during the Archaic period. The two National Register of Historic Places-eligible Archaic period sites—AZ EE:3:172(ASM) and AZ EE:3:173(ASM)—are interpreted as hunting sites or campsites based on the presence of flaked and ground stone tools in the artifact assemblages. The diagnostic artifacts at the sites, primarily projectile points, indicate possible use of these locations during the Middle and Late Archaic periods. If the assemblages are representative of the Archaic period nomadic foraging adaptation to the landscape, then they should inform on the Archaic period adaptation in the area.

The Archaic research theme for this project is broken down into three research topics: culture history; mobility, landscape use, subsistence, and resource exploitation; and settlement, site structure, and site function. Each of these topics is presented below along with its associated research questions.

Culture History

Archaic period remains are relatively sparse in southern Arizona; as a consequence, the hunter-gatherer cultures of this time period are poorly understood. Attention to fundamental archaeological concerns such as material culture and chronology of occupation is therefore essential to a better understanding of the basic cultural historical patterns present in the Archaic period sites in the region.

Research Questions

- When were the Archaic sites occupied?
- What types of artifacts are present at the sites?
- What do the recovered diagnostic artifacts indicate about chronology of occupation?
- Is it possible to distinguish any particular defined archaeological complexes, for example, those presented in Mabry (1998)?

Data Requirements

The data requirements for the topic of Archaic period culture history include assessing and documenting the chronology and material culture of the Archaic sites. If diagnostic artifacts, particularly projectile points, can be found in reliable subsurface contexts and then dated with an absolute method such as radiocarbon, cultural historical models for southern Arizona can be reliably tested and refined. If the sites are present on the surface only, then age determinations will rely on comparisons to existing typologies.

Mobility, Landscape Use, Subsistence, and Resource Procurement

Regional and chronological variations in Archaic period mobility strategies, landscape use, and resource exploitation have not been well documented. For the most part, Archaic period populations were mobile, pursuing resources in various regions depending on the season and localized patterns of environmental productivity. Individual Archaic sites are therefore important because each provides a window into the larger pattern of Archaic period landscape use and resource exploitation.

Research Questions

- During what seasons were the Archaic sites occupied?
- What types of resources were exploited at these locations?
- What strategies and techniques were used in resource procurement and processing?
- What does the nature of the flaked and ground stone assemblages tell us about subsistence strategies and mobility?
- What do the lithic raw material types utilized indicate about landscape use?

Data Requirements

The study of mobility, land use, and subsistence requires data from several sources. The recovery of paleobotanical remains (e.g., pollen, seeds, plant remains) is important not only for understanding the types of resources exploited, but also for reconstructing paleoenvironmental conditions and seasonality of occupation. If present, botanical samples will be collected from meaningful sealed contexts. The identification of cultigens in the botanical record will provide evidence of agriculture. The ubiquity of cultigens will indicate the importance of agriculture in the diet relative to wild plant and animal foods. Additionally, faunal remains will provide important information regarding subsistence and resource exploitation. Artifact analysis will also be important for understanding raw material use, tool form, and tool function, which will in turn provide insight into mobility, land use, and subsistence. Lithic analysis will be particularly important in the absence of subsurface deposits.

Settlement, Site Structure, and Site Function

Another important research topic that will be explored during data recovery is Archaic period settlement, site structure, and site function. During the Class III inventory, AZ EE:3:172(ASM) and AZ EE:3:173(ASM) were classified as short-term campsites based on the surface artifact assemblages. However, a more detailed functional classification may be possible based on subsurface excavation and the comprehensive recording and analysis of the surface artifacts. Analysis of the site structure of AZ EE:3:172(ASM) and AZ EE:3:173(ASM), therefore, has the potential to provide insight into the settlement strategies, land-use patterns, and resource-procurement tactics of hunter-gatherers during this time period.

Research Questions

- What types of features are present at the sites?
- What are the possible functions of these features?
- Based on artifact distribution, type, and inferred function, were areas of the sites utilized for specific activities?

Data Requirements

In order to understand site structure and function, it will be necessary to document and assess the spatial distribution of the features and artifacts within the sites. This data requirement will be satisfied through detailed site mapping. As part of this process, WestLand will assess the function of the individual feature types. Activity areas are one type of feature expected to be present. Activity areas can be further classified according to the types of activities conducted there. Site structure will also be considered in the context of local landscape features such as ridges, slopes, and arroyos in order to differentiate between functionally and culturally determined use of space.

Research Theme 2: Formative Period (A.D. 1–1450) Native American Utilization of the Development Project Area

AZ EE:3:175(ASM) has been identified as a Formative period resource-procurement and/or processing site. Resource-procurement and processing sites are temporary localities resulting from the exploitation of a variety of resources. They are often located on remote portions of the landscape where wild plant, animal, or lithic resources were procured and/or processed prior to transportation back to the more permanent settlements. Research at the site will examine three basic topics: chronology, cultural affiliation, and typological and functional analysis.

Chronology

Research Questions

- When was the site occupied?
- Can a history of occupation be reconstructed for the site using chronological data?
- Were there different periods of occupation with hiatuses at the site, or was the site occupied a single time?

Data Requirements

Absolute dating techniques (techniques that provide a calendar date or range of dates) that may be used to date the remains recovered from the site include radiocarbon dating, archaeomagnetic dating, and possibly dendrochronology. Relative dating techniques (those that date remains in a sequence relative to each other) that may be used include ceramic analysis and stratigraphic

seriation of the various deposits, features, and artifacts. Numerous kinds of remains can be subjected to these techniques, including organic remains (radiocarbon dating), pottery (ceramic cross-dating), macrobotanical remains of hardwoods (dendrochronology), layered archaeological deposits (stratigraphic seriation), and hearths and other burned features (archaeomagnetic dating).

Cultural Affiliation and Regional Interaction

Archaeology defines prehistoric cultural traditions based on shared cultural practices as reflected in the artifacts, features, settlement structure, and mortuary practices of prehistoric populations. Cultural affiliation implies that people ascribe to a particular cultural pattern as a matter of choice or coercion. AZ EE:3:175(ASM) was determined to be affiliated with the Hohokam culture. However, the area lies on the fringe of the Hohokam sphere of influence and may therefore exhibit traits and influences from the surrounding regions as a result of varying degrees of regional interaction and exchange.

Research Questions

- What does the site indicate about patterns of regional interaction and exchange?
- What does the site indicate about the cultural affiliation of its occupants?
- Do the ceramics from the site conform to the standard typologies for Formative period ceramics from nearby regions?
- Is there any evidence to suggest the presence of a local ceramic tradition that is distinct from the surrounding regions based on technological or stylistic qualities?

Data Requirements

Data relevant to addressing questions of cultural affiliation and regional interaction will derive from careful studies of the features and material culture (specifically the ceramic artifacts) present at the site. Feature and artifact types and styles will be compared to those of nearby regions for similar time periods to ascertain possible regional influences. Artifact analyses will involve typological classification according to the extant body of material culture studies. Depending on the findings of these typological analyses, more detailed studies of the chemical and physical properties of the artifacts may be conducted to identify manufacture provenance or to evaluate the potential for the development of local production centers.

Typological and Functional Analysis

AZ EE:3:175(ASM) appears to have been the setting of a restricted range of economic pursuits directly associated with collecting and/or the initial processing of local resources. The most prominent resources procured at the site were probably vegetal foodstuffs, although the hunting and processing of animal foodstuffs may have also occurred.

Research Questions

- What was the possible function of this resource-procurement and/or processing site?
- Was it the location of only one activity, or did multiple activities take place there?
- To what extent or to what degree were products processed or altered there (e.g., only enough for transport to a habitation site; enough to produce final finished articles; or to some intermediate degree)?

Data Requirements

Data to answer these questions reside primarily in the artifact assemblage from the site. Analysis of the flaked and ground stone tools and ceramic artifacts is essential in determining what activities were carried out at the site. When available, information from feature excavations, and perhaps faunal and botanical remains, could also help to determine the function or functions of the site.

Research Theme 3: Historic Period (ca. 1911–1912) Railroad Construction in the Development Project Area

The Historic period railroad construction camps on the 8,212-acre development property—AZ EE:3:57, AZ EE:3:166, and AZ EE:3:168 (all ASM)—have the potential to contribute significant information to our understanding of the impact of the railroad on the economic, technological, and social development of the region. Research questions about railroad construction camps in the historic West include variability and change in railroad construction technology, camp society and culture, evolution of railroad landscapes, organization of railroad worker camps, the production and consumption of commodities in the camps, ethnicity and ethnic relations, and social structure (cf. Noble and Spude 1997:17).

The railroad has had a significant impact on the creation and growth of the town of Benson. Benson was established in 1880 as the shipping point for Tombstone to the south when the SPRR came through southern Arizona. It was a central location for railroad construction and traffic after that time. The New Mexico and Arizona Railroad, the Arizona and Southeastern Railroad Company, and the EP & SW all ran track through the town at one time or another. The segment located in the development property was part of the EP & SW and was the Tucson extension constructed in 1911–1912.

The Historic period construction camps in the development property contain potential areas for tent platforms and artifact assemblages, including domestic trash. They reflect the temporary habitations of railroad workers building the railroad through the development property. The historical railroad camp investigation is broken down into four research topics: chronology, the built environment, household archaeology, and ethnicity and ethnic relations.

Chronology

Archival data reveal that the railroad was built through the APE in 1911–1912. In addition, the railroad construction camps had some chronologically diagnostic artifacts in their surface contexts. American Bottle Company bases with the "A B. Co." placed horizontally provide a date range of 1905 to 1914 (Lockhart et al. 2007). In addition, the presence of numerous shards of sun-colored amethyst glass (pre-1920) and a V-nickel with a date of 1909 suggest that the camps could have been used during the construction of the railroad.

Research Questions

- How long were the camps occupied? Can the proposed occupation period of 1911–1912 be confirmed?
- The sites may have multiple features. Can a sequence of feature construction/use be determined for each site?
- Were the camps occupied at the same time?

Data Requirements

The principal method for reconstructing a detailed chronology of occupation at the camps will be to use archival data in conjunction with the analysis of the chronologically diagnostic artifacts. For the Historic period, the manufacture and use of many artifacts can be assigned to relatively restricted ranges of absolute dates. In addition, the presence of stratified buried deposits can help elucidate the occupational history of a site, possibly providing information about the length of occupation and periods of abandonment and re-use. Data requirements can be satisfied through intensive site reconnaissance and controlled surface collections and excavations. Specifically, diagnostic surface artifacts will be collected and areas in and around the identified structures will be excavated to target any stratified deposits that may be present and that might provide information relevant to site chronology (see Work Plan section below).

The Built Environment

The historical railroad camps considered here were the locations of small-scale, short-term settlements directly associated with nearby railroad construction. Because of this intermittent and short-term settlement pattern, the structures on these sites are expected to be insubstantial and poorly preserved. As Wilk (1990) discusses, factors related to investment in household architecture include the presence of women and/or children working in the home or in home-based businesses, the importance of the household as a setting of social reproduction and inheritance, and the cultural value placed on the home and housework. In the case of small railroad camps, all these factors are expected to have been given low weights, resulting in very little investment in the habitation.

Research Questions

- What types of tent structures were used or built on the sites?
- What construction materials and methods were used to build these living quarters? Did they vary within the site?
- What other types of features were constructed at the sites?
- What construction materials and methods were used to build the non-tent features? Did these vary among feature type?
- What was the spatial relationship between the residential (tent) features and the other features at the sites?
- What do the artifact assemblages tell us about the relative importance of residential and non-residential (e.g., railroad construction) activities at the sites?

Data Requirements

In order to understand the built environments of these sites, it will be necessary to document and assess the spatial distribution of the features and artifacts within each site. This data requirement can be satisfied through detailed site reconnaissance, mapping, and controlled excavations. Specifically, areas in and around the identified structures will be excavated to target any material remains present that might provide information relevant to the functions of the different features and the kinds of activities that may have been carried out at the sites (see Work Plan section below).

Household Archaeology

Archaeologists frequently study the household as the minimal cooperating unit of society. Households are small groups of individuals who cohabit in a single residence or group of related structures and cooperate—to varying extents—in economic and social activities, frequently making them the smallest archaeologically recoverable economic unit of society (Blanton 1994; Netting et al. [eds.] 1984; Wilk [ed.] 1989). Houses (the physical spaces occupied by households) can be identified by examining architecture, the distribution of features, and artifact assemblages. If houses are identified, then important questions regarding the demography of the household and the settlement can be addressed.

Railroad construction camps, especially small operations like those represented by the three sites to be investigated here, offer an opportunity to study interesting and distinctive types of households. It is clear from newspaper articles from the era that a great many, if not all, of the railroad construction workers were single men who were unskilled at anything but hard labor. What Hardesty (2010:110) has written about mining camps is probably appropriate for railroad camps as well: "[the mining camp] emerges as a place mainly inhabited by adult males with high mobility, cosmopolitan origins, and a poorly developed sense of community." A common pattern involved small- to medium-sized groups of non-related co-residential males. These are characteristics of what we know about railroad construction camps as well.

Food was purchased at local stores or markets rather than raised; each member was responsible for his own provisions and consumption; and members were not generally responsible for child-rearing. In these kinds of households, members were highly mobile, and membership might change frequently over the period of occupation of the tent.

On the other hand, in single-family households, members cooperated in provisioning the household and in the provisions' consumption, and activities related to child-rearing were common. Archival evidence suggests that only males worked on the railroad and lived at these camps, with females and children left behind at home or in town (cf. Hardesty 2010). However, single-family households cannot be completely ruled out at this time.

These two types of households leave distinctive assemblages of artifacts and features in the archaeological record. For instance, cooking and food consumption in all-male households were likely to have been carried out in a separate structure or outside the structure, while in single-family households, these activities would more likely occur in the same structure as other household functions. The distribution of these functions might be indicated by the spatial distribution of cooking (e.g., cookware, food tins) and service-related (e.g., plates and bowls, utensils) artifacts. In addition, certain artifact types might indicate the presence of women (e.g., cold cream jars, jewelry) or children (e.g., toys, dolls). Remains of clothing and footwear might also indicate the range of genders and ages represented at a given site.

Research Questions

- What kinds of households/population groups occupied the sites (e.g., nuclear families, groups of men, a single railroad laborer, etc.)?
- What activities took place at these locations?
- Were these activities directly and exclusively associated with railroad construction, or were other types of activities/services performed?
- Who lived at the site (e.g., genders, number of individuals, age distribution, etc.) and did this demographic pattern change through time?

Data Requirements

In order to understand the nature of the households on a particular site, it will be necessary to document and assess the spatial distribution of the features and artifacts within that site. This data requirement can be satisfied through detailed site reconnaissance, mapping, artifact analysis, and controlled excavations. Specifically, areas in and around the identified structures will be excavated to target any material remains present that might provide information relevant to the worker household (see Work Plan section below). In addition, archival information in the form of newspaper and informant accounts and/or photos of life at the camps may also be used.

Ethnicity and Ethnic Relations

Preliminary archival information suggests that railroad construction attracted people from many different backgrounds and ethnicities to the region. In the Benson area, it appears that the most prominent ethnic groups were the "white" Euroamericans composed primarily of people of Anglo and Irish descent and the "Mexican" groups composed primarily of native-born Mexicans and their Mexican-American descendants. However, other ethnic groups may have worked on railroad projects in Arizona. It appears that many, if not all, of the supervisors were white and that many of the workers were Mexican or of Mexican-American descent. It isn't clear whether these two ethnic groups lived at the same locations together and what sort of relationship existed between them.

While determining ethnicity from archaeological remains is a contentious issue (see Emberling 1997; Jones 1997), some researchers have had success looking for different ethnic groups in Historic period contexts. For instance, in excavations at factories and posts involved in the Canadian fur trade, Pyszczyk (1989) succeeded in identifying the ethnicity of laborers in all-male households by comparing artifact assemblages excavated from buried contexts to records of commissary purchases made by Francophone and Anglophone laborers. Likewise, Horning (2000) used architecture and artifactual data to assess how residents of small villages in the Blue Ridge Mountains of Virginia created and maintained their own ethnic identity in the face of modernizing processes and immigration.

In studies of other historic contexts such as mining camps and urban enclaves, significant success has been achieved in identifying people of Chinese origin in the historical record. Miners of Chinese origin might be distinguished by the presence of material culture markers such as opium paraphernalia (e.g., pipe bowls and lamps) (Foster et al. 2004). Hardesty (2010) was successful in identifying Chinese households at Shoshone Wells in Nevada based on the presence of distinctive tablewares (e.g., Jian You, Swatow).

People who embraced Mexican and Mexican-American identities are more difficult to distinguish in the archaeological record. For instance, Mexican ceramics may be used by Mexican-American families, as was the case in the original Phoenix townsite (Henry and Garrow 1982). However, it is unclear whether such cases reflect cultural choices associated with ethnic identity or if they are simply due to the low cost of this kind of pottery (Ayres 1990).

Research Questions

- Is there evidence to link any of the occupants of the sites to a particular ethnicity or descent?
- Is there evidence of multi-ethnic occupants living together on any site?
- Is there any relationship between changes in household composition and ethnicity?
- If there is ethnic variability at the sites, are there any indications of co-occurring economic variability (e.g., are features that appear to be associated with Mexican-Americans in any sense "poorer" than features that appear to be related to Euroamericans, etc.)?

Data Requirements

As these sites have no standing architecture, information about ethnicity will most likely reside in the artifact assemblages. Artifacts such as opium pipe bowls and possibly Mexican ceramics might be markers of ethnicity. In other cases, the assemblage as a whole can be analyzed for differences in practices of consumption that may relate to ethnic identity. As in the Canadian case discussed by Pyszczyk (1989), documentary information about consumption patterns of members of different ethnic groups may aid in such an analysis. In the field, detailed site reconnaissance will identify any surface artifacts not observed during the initial site recording. Additionally, areas in and around the identified structures will be excavated to target any material remains present that might provide information relevant to the ethnic identity of the residents of the site (see Work Plan section below).

Research Theme 4: Historic Period (ca. 1911–1912) Railroads in the Development Project Area

The EP & SW, AZ EE:3:74(ASM), has been thoroughly researched and documented by Old Pueblo Archaeology Center (Jones and Dart 2001b). This fieldwork included the section of the railroad in the development project area and no further documentation is required.

CHAPTER 4: WORK PLAN

The work plan presented in this chapter defines the field strategies and methods, sampling schemes, and analytical methods proposed for the data recovery activities to mitigate the adverse effects of the project on the National Register of Historic Places-eligible properties.

This chapter is divided into eight main sections: site assessment; data recovery fieldwork plan for the six National Register of Historic Places-eligible sites; research methods; reporting; curation; schedule; monitoring and discovery plan; and long-term monitoring plan.

SITE ASSESSMENT

Because so much time has lapsed since the original eligibility evaluations were made, the Corps will ensure that a condition and eligibility assessment of all affected sites is undertaken by a qualified archaeologist prior to any construction-related or archaeological ground-disturbing activities. If there are no changes to the eligibility determinations for the sites, the Corps shall informally consult with the SHPO and authorize archaeological investigations to proceed per the approved HPTP. Changes in the eligibility status of one or more sites will require the Corps to formally consult with the SHPO for consensus determinations of eligibility and to agree on appropriate treatment, if any. Changes in treatment, if necessary, will be documented in an Amendment to the HPTP. The Corps and the SHPO agree to expedite this consultation review within a period of 15 days from receipt.

DATA RECOVERY PLAN

This section describes the sampling strategies and field methods to be used to gather data from the six National Register of Historic Places-eligible archaeological sites and to address the research questions posed in **Chapter 3**. Construction of the 8,212-acre development project is anticipated to be completed in stages over a span of more than 15 years. Data recovery will occur at each site at the time at which its location is included in the pending stage of development of the property. Therefore, the greatest number of potential data recovery stages anticipated under this plan would be the mitigation of the six National Register of Historic Places-eligible archaeological sites in six temporally discrete stages over the development timespan of the property. All stages will include both Phase 1 and Phase 2 data recovery, as well as end-of-fieldwork and final reporting, as detailed below.

The data recovery fieldwork at any given stage will be divided into two phases: Phase 1 data recovery is designed to gather additional information to evaluate and test the interpretations of the sites based on the survey data and to assess the potential of the sites to yield further archaeological information; Phase 2 data recovery will be targeted to those sites determined during the first phase as having the greatest potential to yield the data necessary to address the research questions posed in **Chapter 3**. At the sites selected for Phase 2 excavation, the results of the Phase 1 fieldwork will help to focus the intensive hand-excavations within the portions of the sites more intensively used and with the greatest potential to yield the requisite data and information. The Phase 1 and Phase 2 fieldwork is discussed below. Each phase is divided into a series of tasks.

Phase I

Phase 1 is divided into four tasks. Each task has particular goals, but the overall objectives of Phase 1 data recovery will be to gather a consistent and systematic sample from the sites and to conduct limited test excavations to determine the presence and distribution of the subsurface archaeological deposits and features. Each task is described below.

Task 1: Reconnaissance and Surface Artifact Collections

The goals of Task 1 are to reconnoiter the sites to document the distribution of surface artifacts, collect a sample of the artifacts present on the surface, and identify and map any archaeological features. During site reconnaissance, archaeologists will walk transects across the site spaced at 5-meter intervals to identify features, diagnostic artifacts, and artifact concentrations. Task 1 will provide standardized information from all the archaeological sites.

WestLand will identify, map, and record basic data and information for any newly discovered features identified during Task 1. This information will be added to WestLand's existing site data and supplement the field survey data. WestLand will record metrical data for length, width, and height and nominal information with regard to the physical characteristics of the newly discovered features. Based on the survey data, two fundamental categories of features are known to exist: features made from rocks and artifact concentrations. The features will be classified into rudimentary types based on their descriptive characteristics.

WestLand proposes three surface collection strategies: 1) the point-provenience of culturally, chronologically, and functionally diagnostic artifacts; 2) the systematic collection of artifacts associated with archaeological features; and 3) the collection of the background artifact scatters across the site. All three strategies will be employed at the prehistoric sites, while only the first strategy will be employed at the historical sites. On the Historic period sites, the background artifact scatters will be recorded in the field by qualified historical artifact analysts.

The primary information about the prehistoric sites and their associated activities resides in flaked stone tools, ground stone tools, painted ceramics, red-slipped ceramics, and rim sherds. As part of the first collection strategy, the locations of these artifacts will be mapped with a hand-held GPS device with sub-meter accuracy and the artifacts will be collected for analysis. Rare objects such as shell and human bone will be mapped and collected in a similar manner. Diagnostic artifacts will also be collected from the Historic period sites.

The other two strategies involve the collection of the background artifact scatters that define the prehistoric sites. The objective of collection strategy no. 2 will be to gather the artifacts that are within or adjacent to any of the archaeological features (not including the artifact concentrations) at the prehistoric sites, as identified during the survey and site reconnaissance. Surface collection strategy no. 2 will be employed in the vicinity of any prehistoric features. For each feature, a collection area will be set out that includes the feature and a 4-meter-wide buffer around that

feature. The collection area around the features will consist of 2-by-2-meter units. Following the controlled collection of the diagnostics and artifacts associated with the features (strategies no. 1 and no. 2), all the remaining artifacts at the prehistoric sites will be collected as a single task as surface collection strategy no. 3.

For any structures or features at the Historic period sites, artifact collection will be limited to diagnostics (strategy no. 1), with all other artifacts being analyzed in the field and left in place. The in-field analysis will be done by a qualified historical artifact analyst. The field analysis will include the collection of data on artifact class, artifact counts, minimum number of whole artifacts represented, and any available information about manufacturing techniques.

Task 2: Subsurface Exploration at the Archaic Hunting Sites

At AZ EE:3:172(ASM) and AZ EE:3:173(ASM), two 1-by-1-meter excavation units will be judgmentally placed in areas of relatively high artifact density and at the location of the cluster of the five handstones (the possible cache) at AZ EE:3:172(ASM). The units will be excavated in arbitrary 10-centimeter levels and the sediment will be screened through 1/4-inch mesh. All artifacts will be collected by artifact class (e.g., flaked stone, ground stone, etc.). If surface or subsurface features are discovered, they will be excavated separately from the units using the methods specified in the Research Methods section below. Samples of sediment for botanical and pollen analyses will be taken whenever a promising context is discovered. Promising areas for sediment analysis are defined as any areas with evidence of charred or burned plant material (such as charcoal or ash lenses, hearths, or other similar features). Promising areas for pollen analysis are defined as sealed contexts with no indications of disturbance or bioturbation resting on or within definable prehistoric occupational layers.

Task 3: Subsurface Explorations at the Formative Period Resource-procurement and/or Processing Site

No features were found during the survey and recording of the Formative period resource-procurement and/or processing site (AZ EE:3:175[ASM]). However, it is possible that features or possible features may be located during the site reconnaissance and surface collection tasks. WestLand proposes to judgmentally place two 1-by-1-meter excavation units in areas of artifact density and/or areas where alluvium has collected in cobble lag deposits. The units will be excavated in arbitrary 10-centimeter levels and all sediment will be screened through 1/4-inch mesh.

Task 4: Subsurface Explorations at Historic Period Railroad Camps

The objective of data recovery at the Historic period railroad workers' camps is to explore the visible architectural features—the potential tent platforms—to determine their nature and to recover samples of any subsurface deposits in or around the features. Another objective is to investigate the artifact concentrations near the tent platforms as possible privy locations.

Subsurface hand-excavations at AZ EE:3:57, AZ EE:3:166, and AZ EE:3:168 (all ASM) will consist of excavating a 1-by-1-meter unit in each potential tent platform at each site. Two additional excavation units per site will be excavated in areas of relatively high artifact density to look for possible privy locations.

If additional features are identified during site reconnaissance and surface collection, excavations may be carried out to understand their function and structure, at the discretion of the field director. If such excavations are undertaken, the methods used will be those specified in the Research Methods section below.

The Corps shall ensure that the Permittee prepares a draft preliminary end-of-fieldwork (EOF) report that summarizes the results of any stage of the Phase 1 investigations within fourteen (14) calendar days of the completion of Phase 1 data recovery at AZ EE:3:57(ASM), AZ EE:3:166 (ASM), AZ EE:3:168(ASM), AZ EE:3:172(ASM), AZ EE:3:173(ASM), and AZ EE:3:175(ASM). The Corps shall ensure that the EOF report is drafted after an in-field meeting to discuss the results, if such a meeting is held. The EOF report should include all agreements made during the in-field meeting. The EOF report shall include a brief description of the field methods and features identified, as well as those activities proposed for Phase 2.

Phase 2 Data Recovery

The objective of the Phase 2 data recovery will be to more intensively excavate the structures and features identified and defined during the Phase 1 subsurface explorations and to gather the additional data necessary to address the research questions posed in the research design. Phase 2 data recovery is divided into three tasks organized by site type.

Task 1: Data Recovery at the Archaic Hunting Sites

Data recovery at the Archaic period hunting sites, AZ EE:3:172(ASM) and AZ EE:3:173(ASM), will consist of the excavation of any features, structures, or pit features identified and defined during Phase 1. WestLand proposes to excavate a 1-by-1-meter test unit in each architectural unit discovered. This unit will gather a consistent sample of artifacts and provide the data to evaluate the information potential of each deposit. WestLand then proposes to completely excavate the identified structures (if any) so that the entirety of the floor and associated interior features are exposed. WestLand proposes that if three or fewer structures are identified, then all of the structures will be excavated. If more than three structures are identified, then three structures plus 25 percent of the remaining structures will be excavated. WestLand proposes that if eight or fewer pits are found, then all pits will be excavated. If more than eight pits are found, then WestLand proposes to excavate eight pits plus 25 percent of the remaining pits. If eight or fewer features of other types are found, then all of them will be excavated. If more than eight features of other types are found, then WestLand proposes to excavate eight of the features plus 25 percent of the remaining features. Structures and pit features will be excavated as described in the Field Methods section below.

Task 2: Data Recovery at the Formative Period Resource-procurement and/or Processing Site

WestLand anticipates that the Phase 1 field effort at AZ EE:3:175(ASM)—the Formative period resource-procurement and/or processing site—will adequately characterize the site and that no additional field studies will be necessary during Phase 2 data recovery. However, if subsurface features such as pits are identified during Phase 1, they will be excavated during Phase 2. WestLand proposes that if eight or fewer features are found, then all features will be excavated as described in the Field Methods section below. If more than eight features are found, then WestLand proposes to excavate eight features plus 25 percent of the remaining features.

Task 3: Data Recovery at Historic Period Railroad Camps

WestLand anticipates that the Phase 1 field effort at Historic period railroad camps AZ EE:3:57, AZ EE:3:166, and AZ EE:3:168 (all ASM) will adequately characterize these sites and that no additional field studies will be necessary during Phase 2 data recovery. However, if subsurface features such as privies are identified during Phase 1, they will be excavated during Phase 2. WestLand proposes that if eight or fewer features are found, then all features will be excavated as described in the Field Methods section below. If more than eight features are found, then WestLand proposes to excavate eight features plus 25 percent of the remaining features.

It is important to note that there is some potential for human remains to be recovered during this project. Prior to fieldwork, a Burial Agreement will be negotiated with the ASM. Any human remains discovered during the project will be treated in accordance with the requirements of this agreement.

RESEARCH METHODS

WestLand is dedicated to high-quality scientific research. This section describes the research methods that will be employed by WestLand personnel during data recovery, archival research, the analysis of the archaeological materials, and subsequent reporting. A schedule for completion of the proposed analysis and reporting is also provided.

Field Methods

WestLand will use the following methods, as necessary, for the Phase 1 and Phase 2 data recovery.

Proveniencing, Inventory, and Quality Assurance

WestLand treats archaeological explorations as serious, scientifically valuable undertakings. At all times, control must be maintained over the excavation procedures to ensure the validity of the findings. To this end, WestLand uses integrated provenience, inventory, and quality assurance systems throughout the course of a project. All excavation and study units are considered unique recovery locations and assigned unique provenience numbers. The number assigned to a recovery

provenience is transcribed on all notes, photographs, maps, artifacts, specimens, and any other record or item recovered from that provenience in order to ensure that all the information can be efficiently and accurately linked back to the recovery location. This is required to make useful and meaningful analyses of the spatial associations of the objects and features and the data and recorded characteristics of these objects and features that derive from the subsequent analytical studies. All field bags and containers of artifacts, specimens, sediments, and samples removed from the provenience are assigned inventory numbers. Inventory numbers are unique to individual bags for the lifetime of that bag. These inventory numbers are a way of tracking the location and status of all the bags and materials entrusted to WestLand's care. Throughout the provenience and inventory process, an integrated quality assurance system checks and double-checks the provenience and inventory information. These systems ensure that the information is accurate and the inventory complete.

Spatial Control of the Archaeological Record

WestLand will use GIS programs to maintain maps of the sites, excavation units, and points of interest identified during the excavations. Archaeologists will establish a primary datum at each site. The datum will be used for both vertical and horizontal metric control. Horizontal coordinates will be measured relative to the UTM grid. Supplemental control points will be established as needed. Features will be hand-mapped. Each map will have at least two control points. The horizontal and vertical positions of these control points will be mapped relative to the primary datum and site grid using an optical transit with electronic digital measuring. The hand-drawn maps will be digitized and integrated into the overall site map. The resultant computer-generated maps will be field-checked for completeness and accuracy and later professionally produced for use in the final report. Updated working field maps will be maintained that show the progress of the excavations, including all exploratory units, cultural features, and site boundaries.

Feature Recording

Cultural features identified during Phase 1 and Phase 2 data recovery will be recorded in the field. Features will be drawn to scale in profile and planview. Feature dimensions, shape, fill, visible artifacts, and spatial associations will be described and documented. If an exposed or excavated feature contains organic material that appears to be in situ, then samples will be taken for radiocarbon dating and macrobotanical analysis. Sediment samples will be collected for palynological analysis.

Hand-excavation

The basic hand-excavation unit will be a 1-by-1-meter or 2-by-2-meter unit. Hand-excavations will remove sediment in natural levels or in arbitrary 10-centimeter levels when natural levels cannot be defined. Units will be excavated to an adequate depth to ensure that the lowest cultural stratum has been recovered. Sediments from these units will be screened through 1/4-inch mesh and the artifacts collected according to provenience.

Extramural Feature Excavation

Extramural features are typically pits of various functions. After mapping and initial recording, the pits will be divided into two sections. One section will be excavated. Fill will be removed in stratigraphic or arbitrary levels and screened through 1/4-inch mesh. Six-liter sediment samples will be collected from features with abundant visible charcoal and ash for macrobotanical analysis. Smaller sediment samples will be collected from excavated extramural features for palynological analysis. The contexts targeted for palynological studies will be the fill and the bottom surfaces of the features.

Other possible extramural features that may be discovered include occupation surfaces and ash and charcoal lenses. Such features will be excavated by placing a 1-by-1-meter or 2-by-2-meter unit in the approximate center of each feature (smaller unit sizes may be used for particularly small features). Hand-excavations will remove sediment in natural levels or in arbitrary 10-centimeter levels when natural levels cannot be defined. Units will be excavated to an adequate depth to ensure that the lowest cultural stratum has been recovered. Sediments from these units will be screened through 1/4-inch mesh and the artifacts collected according to provenience. In the unlikely event that other feature types are discovered, they will be excavated by methods consistent with those described below, as determined by the field director in consultation with the principal investigator.

Architectural Features

No architectural features were documented during the Class III surveys. However, if architectural features are found during excavation, then several characteristics will be recorded. First, the style of the architecture is often indicative of cultural identity and usually representative of a particular cultural era. Second, these features are the constructed "activity spaces" where a variety of day-to-day activities took place, and their interior floor spaces have been known to yield a wealth of archaeological information. Third, after abandonment, architectural features are commonly used as trash repositories, and the fill of these structures usually contains an abundance of day-to-day debris. The objective of the excavation strategy will be to gather a sample of information from each architectural feature discovered and to expose the floor area and architectural details. The decision as to which structures to excavate will be based on the following qualities.

Burned structures are rich information resources because the fiery destruction of the house often preserves construction details that are not preserved otherwise. In addition, the house fire often traps objects inside the structure that would have been removed under more normal abandonment circumstances. Thus, burned structures often provide the opportunity to catch a momentary glimpse of ancient behavior. Because of their information potential, burned structures will be preferentially excavated to the limits of the sampling fraction discussed under the work plan. The purpose of these excavations will be to recover architectural details as well as those artifacts and sediment samples from the floors of the structures that relate to intramural household activities.

Unburned structures may also contain assemblages of tools and items left on the floor at abandonment, but these assemblages usually reflect only a small portion of the materials in the house. Typically, they are devoid of any usable items and do not offer the same information potential with regard to household utensils and facilities. They still may possess useful information, however. Architectural details can reflect cultural affiliation, and often embedded in the floor are microscopic traces of the activities that took place in the house. Selected unburned structures may be chosen for excavation to augment the sample of burned structures. Decisions to further excavate the structure will be based on its size, morphology, and artifact content. The intent will be to ensure a sample that represents the variation in the architecture present.

Below is an overview of the excavation methods that will be employed for the architectural features:

- After discovery, a 2-by-2-meter test pit will be excavated in each structure identified. The test pit will be excavated in natural levels or arbitrary 10-centimeter levels if natural levels are not distinguishable. All sediments will be sifted through a 1/4-inch sieve for artifact recovery. All artifacts captured by the screen will be collected regardless of actual size. Sediment samples will be collected from the levels for macrobotanical analysis when there is evidence of charred plant materials. Additional sediments will be collected specifically from the floor contact for palynological studies.
- Archaeologists will select architectural features for further analysis based on the sampling strategy discussed above. The remaining architectural features will be excavated as described below.
- Fill deposits in the structures will be characterized as one of two primary depositional units: 1) post-collapse trash and sediment accumulations and 2) structural debris above the house floor. The former layer contains trash accumulations that reflect post-abandonment activities or the natural processes of erosion and deposition at the site. The latter layer contains the artifacts and other materials that were in the house at the time it collapsed. Fill deposits will be removed *en masse* to within 10 centimeters of the floor. This unit will not be screened, but a grab sample may be taken to recover chronologically diagnostic artifacts.
- All fill within 10 centimeters of the floor (the near-floor fill) will be sifted through a 1/4-inch sieve to recover materials in association with the floor.
- Interior features exposed in the house will be excavated and the fill sifted through a 1/4-inch sieve for artifact recovery.
- Sediment samples will be collected for palynological studies from sealed contexts beneath objects found in place on the floor surface of the structure, from the fill of the firepit or hearth, from the floor surface surrounding the firepit, and from other contexts based on the field director's judgment as informative contexts.
- Sediment samples for the recovery of charred botanical materials will be collected from the hearths, fire pits, and other thermal features in the structures. Samples will also be collected from the floor fill in burned houses.

Mortuary Excavation

The treatment of human remains is a sensitive aspect of any archaeological project. It is remotely possible that burials will be encountered at the sites during excavation. At all times, WestLand employees and their representatives will treat the human remains with respect and dignity. Prior to fieldwork, a Burial Agreement will be negotiated with the ASM. All human remains and associated funerary items will be treated according to the stipulations, requirements, and limitations set out in the Burial Agreement. Animal burials will also be treated according to this agreement.

Field Records

The field director and crew chiefs will keep a field journal detailing all daily activities. Standardized field forms recording the details of the excavations will be completed by personnel as the fieldwork progresses. Scaled drawings will be made of all features in both planview and cross-section. A photographic record will be kept in both print and digital formats.

Analysis Methods

All artifacts, samples, photographs, maps, and field notes will be housed in WestLand's archaeology laboratory. Artifacts will be cleaned and processed according to the guidelines established by the ASM. Artifact provenience data will be entered into an electronic database and verified for accuracy before any analysis begins. Some diagnostic artifacts and samples may be temporarily transferred to professional consultants for analysis. Once the materials have been analyzed, they will be prepared for curation at the ASM. The analytic methods to be employed are described below.

Chronometric Samples

WestLand anticipates that two chronometric dating techniques will be used to date the archaeological record: archaeomagnetic dating and radiocarbon dating. Archaeomagnetic samples will be collected by WestLand personnel who have several years of experience and training in the collection and analysis of archaeomagnetic dating samples. Samples will be measured at the University of Arizona's Paleomagnetic Laboratory. Radiocarbon dates may also be used to supplement the archaeomagnetic data and to date the Formative period contexts. Radiocarbon samples are critical in the determination of absolute dates, which in turn inform the broad chronological questions. Sample integrity must be considered and recorded, and burned annuals should be emphasized over charcoal due to the "old wood problem." Carbon 14 samples with the lowest potential for disturbance will be analyzed first.

Flaked Stone Analysis

Flaked stone artifacts will be subjected to a detailed attribute analysis. First, the assemblage will be segregated into tools and debitage. All tools will be analyzed. Analysis will include the identification

and recording of the tool's morphological attributes, raw material type, and typological attributes. Depending on the amount of debitage recovered, a 10 percent or more sample may be analyzed. The focus of the tool analysis will be functional interpretation; the focus of the debitage analysis will be to characterize reduction and tool production strategies.

Ground Stone Analysis

Ground stone artifacts are bulky and heavy. Repositories faced with diminishing space for storing artifacts from archaeological excavations are encouraging curation of a more selective sample of such artifacts. As with the other artifact classes, the bulk of the ground stone may be fragments with little retentive value. In coordination with the ASM curator, WestLand has developed a plan for the in-field analysis of the bulk of the ground stone artifacts. Complete and near complete (more than 75 percent of the artifact present) small items (such as handstones) and all rare items (such as palettes, censers, plummets, and pendants) will be collected for curation. Broken ground stone artifacts re-used as thermal mass in cooking features will be analyzed in the field. The bulkiest items, the large netherstones, will be analyzed in the field, photographed, and left in place. The in-field analysis will include the same variables and attributes as the laboratory analysis and will be conducted by a trained ground stone analyst. Analytical methods will be based on Adams' (2002) framework for the analysis and interpretation of ground stone tools. In-field and laboratory analysis will be uniform and focus on gathering the necessary typological and morphological data to understand ground stone production and use.

Ceramic Analysis

Ceramic artifacts include both pottery containers and other more esoteric objects such as beads and figurines. The ceramics will first be separated into pottery and non-pottery categories. Non-pottery artifacts will typically be assigned to categories based on qualities of manufacture, decoration, and inferred function. Pottery artifacts will be subjected to a classificatory analysis based on the prevailing ceramic typologies for the area. Pottery sherds less than the size of a U.S. quarter will be sorted into basic categories of painted, red-slipped, and plain wares and counted. Additional typological classification will be made only in specific cases. All painted and red-slipped decorated pottery larger than a U.S. quarter will be typologically classified according to prevailing pottery typologies. Descriptive categories may be created to account for pottery that does not conform to defined types. Vessel form information will be recorded for all decorated pottery. A 10 percent sample of the undecorated pottery larger than a U.S. quarter will be classified into descriptive categories based on the characteristics of paste, temper, and surface finish. Vessel form information will be recorded only for undecorated rim sherds.

Marine Shell Analysis

Shell artifacts will be identified to the genus and species level, and the analyst will assign each specimen to previously established artifact categories. The analysis will include a discussion of the contexts in which the artifacts occur.

Faunal Analysis

Faunal remains collected in the field will be carefully and appropriately packaged, handled, and cleaned prior to analysis to ensure that no damage occurs. The materials will first be "rough sorted" and assigned to a taxon prior to conducting a more detailed study of the remains. Any signs of cultural modification will be noted. Bone and antler tools such as awls and billets may be illustrated and will be analyzed in detail. In many cases, 1/4-inch mesh is insufficient to recover faunal remains, and 1/8-inch mesh or flotation may be used instead. The basic measures of abundance that will be used to quantify the faunal assemblages are Number of Identified Specimens (NISP) and Minimum Number of Individuals (MNI).

Human Remains

Human skeletal materials will be treated with the utmost care, respect, and professionalism. All pertinent laws, guidelines, and regulations will be rigorously followed. Prior to fieldwork, WestLand will obtain a Burial Agreement from the ASM. The excavation and analysis of the human remains will proceed in accordance with the terms of this agreement. All bone discovered during fieldwork will undergo an initial in-field examination to determine whether or not it is human or potentially human. A good faith effort will be made to ensure that all burials within the sites are located and that all osteological materials associated with an individual are recovered and stored together. Prior to repatriation, individual burials will be stored in natural materials, under lock and key, and in a respectful and protective environment.

Paleobotanical and Palynological Analysis

Paleobotanical and pollen remains are typically recovered from special subsurface archaeological contexts. Following standard protocols, soil samples will be collected during testing and excavation; in particular, flotation soil samples will be collected from feature contexts. Pollen samples will be collected from sealed or otherwise reliable contexts. Post-fieldwork, samples believed to have the potential for paleobotanical and pollen remains will be processed in order to recover those materials. Prior to selection for analysis, soil samples will be ranked in the field according to criteria such as context, burning, and integrity. The highest ranked samples will be given priority amongst those selected for analysis by specialists. When available, pollen and macrobotanical samples recovered from the same context will be examined in order to obtain as complete a record of subsistence activities and past environmental conditions as possible. Some artifacts may be subjected to a pollen wash depending on their context. In other cases, an artifact with in situ pollen-laden soil may be packaged intact for later analysis of the soil.

Historical Artifacts

Artifacts recovered from historical sites tend to be organized into material classes as well as functional classes. Material classes are straightforward and include categories like glass, ceramics, and metal.

Functional classes were really first brought to the forefront of historical site archaeology by Stanley South (1975:95–102) and his original nine groups of artifacts. This initial attempt has been modified numerous times since, with various researchers contracting the categories to as few as seven (Thiel 1998) or expanding them to as many as 18 (Goodman et al. 2005). This study will use 10 categories: kitchen, architecture, firearms, clothing, personal, activities, transportation, mining, medical, and recreation.

The material classes are as follows.

Glass

At a minimum, glass analysis will consist of the identification of color, finish, and form. It will also emphasize documentation of the makers' marks and product embossing, which will help date the site and provide information on commodity use. The bulk of any glass assemblage is typically fragments from the bodies of bottles. These fragments usually provide limited information, although sun-colored amethyst glass, for example, can provide an approximate date range. Bottle manufacture and product information can inform on the commodities available at a site, supply and demand, and ethnicity and economic status.

Ceramics

Ceramics from the railroad camp sites will be separated into ware type, vessel form, and decorated element. Ware types consist of categories like earthenware, stoneware, whiteware, and porcelain. The type of ware can be an indicator of socio-economic status. Vessel forms can inform about the types of activities taking place and include plates, cups, saucers, bowls, and serving dishes. The decorated element can be indicative of socio-economic status as well as potentially provide a date of manufacture.

Metal

Metal is one of the more common artifacts found at historical sites. Metal also tends to lose its surface and structural integrity through corrosion and exposure to the elements, which destroy or obscure the information needed to determine function and manufacturer. Metal will be separated into identifiable and unidentifiable categories. The identifiable artifacts will be separated into functional categories, including kitchen, clothing, personal, and firearms. The unidentifiable artifacts will be separated into metal types (e.g., iron, copper, brass, gold) and weighed.

Other Materials

The majority of the artifacts recovered from historical sites are glass, ceramic, and metal; however, artifacts made from other materials are sometimes present as well. These other materials include rubber, leather, shell, wood, synthetics, brick, and paper.

Functional Classes

The functional classes of artifacts used for this study will be kitchen, architecture, firearms, clothing, personal, activities, transportation, mining, medical, and recreation.

Kitchen artifacts are those related to the preparation, consumption, and storage of food. Architectural artifacts are those associated with the construction and maintenance of a dwelling, building, or structure. The firearms category is related to the use, maintenance, and reloading of firearms. Clothing, obviously, consists of things that people wear every day. Personal artifacts are objects like jewelry, coins, keys, tobacco items, and watches. Activity items include household tools, toys, etc. The transportation category includes artifacts related to getting people across the landscape (e.g., horse tack, wagons, and automobiles). Objects related to mining might include specific tools, special supplies, and equipment. Medical and hygiene are related to the personal health and hygiene of the people living at the site and would include medicines as well as toothpaste, toothbrushes, combs, and razors. Finally, recreation includes alcohol, soda, sporting goods, hobbies, and gambling.

REPORTING

At the conclusion of a stage of fieldwork, WestLand will prepare an end-of-fieldwork (EOF) report. This preliminary report will consist of a description of the work that was accomplished, the features documented, drafted maps, and recommendations for further work. The EOF report for all Phase 1 investigations shall be submitted to the Corps within fourteen (14) calendar days of the completion of Phase 1 data recovery at AZ EE:3:57(ASM), AZ EE:3:166(ASM), AZ EE:3:168(ASM), AZ EE:3:172(ASM), AZ EE:3:173(ASM), and AZ EE:3:175(ASM). The Corps shall ensure that the EOF report is drafted after an in-field meeting to discuss the results, if such a meeting is held. The preliminary report should include all agreements made during the in-field meeting. The preliminary report shall include a brief description of the field methods and features identified, as well as those activities proposed for Phase 2.

At the completion of any Phase 2 data recovery efforts, an EOF report will be submitted to the Corps for review and distribution to consulting parties.

A draft final report complying with SHPO reporting standards will be prepared and submitted for review. Upon receipt of comments, WestLand will make all the necessary revisions and produce a final report documenting the findings of the archaeological studies. In the event that the data recovery project is conducted in stages that correspond to development stages, a separate final report will be written for each data recovery stage. In the event that the data recovery is done in stages that correspond to the construction sequence, a synthesis report that incorporates the results of all stages of data recovery will be prepared after the final stage of data recovery. At a minimum, the final report will contain the following:

- A title page listing the title of the report, the author(s), the dates of fieldwork, the firm responsible for the report, the date submitted, the contract number under which the work was performed, the project number, the permit number, and the sponsor

- A SHPO-approved administrative summary
- A table of contents
- A list of figures and tables
- Personnel information identifying the staff, their job titles, and their individual duties
- A general introduction discussing the purpose and background of the study
- The research strategy and an overview of the regional prehistory of the area
- A detailed discussion of the fieldwork and laboratory analysis procedures
- An overview of the area's present and past natural environment
- A thorough discussion and interpretation of the data recovery results. These findings will be examined from both a local and a regional perspective. Previous and current archaeological studies from the area will be assimilated into the report.
- A detailed description of how the analyzed data relate to the research goals outlined in the data recovery plan; an interpretation of any perceived patterns; and an evaluation of the project's effects on cultural resources.
- Professional-quality maps and photographs

CURATION

After all the artifacts, samples, photographs, maps, and field notes have been analyzed and incorporated into the final report for a stage of fieldwork, they will be transferred to the ASM, which will serve as the permanent repository for the collection. The collection will be completely inventoried, documented, and annotated according to ASM guidelines.

SCHEDULE FOR COMPLETION

Prior to initiating data recovery efforts for any stage of fieldwork, WestLand will obtain the necessary permits to comply with ASM guidelines, including a project-specific permit and a repository agreement. Acquiring these permits will take approximately 30 days.

Once the Corps has given notice to proceed with the implementation of this data recovery plan and the associated memorandum of agreement, the necessary permits have been obtained, and a stage of development that includes the location of at least one of the six National Register of Historic Places-eligible sites has been identified, WestLand archaeologists will mobilize for fieldwork. A 2-week preparation period is anticipated between receiving the notice to proceed and

the start of fieldwork. The Phase 1 data recovery of the sites within the development stage will be performed first. The findings of the Phase 1 data recovery will be evaluated as detailed in the Work Plan section above in order to define the final scope of the Phase 2 data recovery effort. If the nature of the archaeology requires deviation from the data recovery plan as set out in this document, then WestLand will consult with the Corps. Otherwise, WestLand will immediately initiate Phase 2 data recovery within the development stage, as set out in this plan.

Within 14 days of the completion of the stage of Phase 2 data recovery, WestLand will prepare and submit an end-of-fieldwork report. This preliminary report will contain a description of the work accomplished, the features documented, drafted maps, and a summary of the archival resources reviewed. WestLand will then begin the analysis of the field data, artifacts, and samples collected. WestLand anticipates that the analyses and the preparation of a complete draft report of the findings of the Phase 2 data recovery will be complete within 6 months of the completion of fieldwork.

ARCHAEOLOGICAL MONITORING AND DISCOVERY PLAN

This discovery plan is designed to identify the procedures to be followed if, after data recovery is completed and during construction activities, archaeological materials or human remains are discovered inadvertently.

WestLand archaeologists will be available to monitor construction activities should that be required. In addition, WestLand will be available to provide a 1-hour training session for construction personnel on the procedures to be followed in the event of an unanticipated discovery. Those procedures will consist of the following:

1. The construction foreman will halt all activities in the vicinity of the find.

2. The foreman will notify WestLand's Senior Archaeologist, who will immediately notify the Corps and the SHPO.

3. WestLand archaeologists will assess the nature of the find and will consult with the Corps and the SHPO to determine its treatment.

4. In the event of the discovery of human remains and associated artifacts, WestLand will notify the Corps and the Director of the ASM, as required by Arizona Revised Statute §41-865.

5. The Museum Burial Coordinator will then consult with the appropriate Native American group(s), as identified in the Burial Agreement obtained for the project.

6. Treatment will follow in accordance with the stipulations of the Burial Agreement.

7. In the event of an unanticipated discovery, the Corps will proceed pursuant to the provisions of 36 CFR 800.13.

LONG-TERM MONITORING PLAN

In the event that the implementation of the mitigation measures for each site is phased over multiple years to coincide with the development schedule, each site not mitigated will be assessed by a qualified archaeologist on an annual basis to determine whether it has been adversely impacted by erosion or other means. Monitoring shall begin within one (1) year of the execution of the Memorandum of Agreement. A formal report of the results of monitoring will be sent to the Corps and the SHPO if any damage is recorded. In the event that there are no concerns, an informal letter report will be submitted via e-mail.

ADDITIONAL RECOMMENDATIONS

Arizona Revised Statute §41-865 ensures that human remains, funerary objects, sacred objects, and objects of cultural patrimony identified on private lands are treated with respect and dignity, and provides guidance concerning the reporting and disposition of these materials. WestLand provides the general recommendation that all ground-disturbing activities have the potential to unearth human remains and associated objects, and that any such discoveries must be treated in accordance with Arizona Revised Statute §41-865.

REFERENCES

Adams, Jenny L.
2002 Ground Stone: A Technological Approach. University of Utah Press, Salt Lake City.

Advisory Council on Historic Preservation (ACHP)
2002a Exemption Regarding Historic Preservation Review Process for Projects involving Historic Natural Gas Pipelines. *Federal Register* 67(66):16364.

2002b Clarification of Exemption Regarding Historic Preservation Review Process for Projects Involving Historic Natural Gas Pipelines. *Federal Register* 67(81):20723-24.

Altschul, Jeffrey H., and Bruce A. Jones
1990 *Settlement Trends in the Middle San Pedro Valley: A Cultural Resources Sample Survey of the Fort Huachuca Military Reservation.* Technical Series No. 19. Statistical Research, Inc., Tucson.

Ayres, James E.
1970 Two Clovis Fluted Points from Southern Arizona. *The Kiva* 35:121–124.

1990 *Historic Archaeology at the Tucson Community Center*. Prepared for the Tucson Development Corporation, Archaeological Series No. 181. Arizona State Museum, Cultural Resources Management Division, Tucson.

Blanton, Richard
1994 *Houses and Households: A Comparative Study*. Plenum Press.

Bowers, Rion
2004 *Summary of Cultural Resources Survey Reports for Whetstone Ranch.* WestLand Project No. 460.16 500-500. Letter to David Laredo, 15 January 2004.

Brown, D. E., and C. H. Lowe
1994 *Biotic Communities of the Southwest*. University of Utah Press, Logan.

Carlson, David, Jeanne Swarthout, and Stan Freer
1989 Lithic Technology along the All American Pipeline. In *Cultural Resources Report for the All American Pipeline Project*, pp. 647–678. New Mexico State University, Las Cruces.

Clark, Jeffrey
1995 Domestic Architecture in the Early Classic Period. In *The Roosevelt Community Development Study: New Perspectives on Tonto Basin Prehistory*, edited by Mark D. Elson, Miriam T. Stark, and David A. Gregory, pp. 251–305. Anthropological Papers No. 15. Center for Desert Archaeology, Tucson.

Cordell, Linda S., and Maxine McBrinn
2012 *Archaeology of the Southwest*. Left Coast Press.

Crown, Patricia L.
1994 *Ceramics and Ideology: Salado Polychrome Pottery*. University of New Mexico Press, Albuquerque.

Deaver, William L.
2010 *Mescal Wash, AZ EE:2:51(ASM), Archaeological Explorations in the Union Pacific Pantano Realignment*. Cultural Resources Report 2009-23. WestLand Resources, Inc., Tucson.

Deaver, William L., and Richard Ciolek-Torrello
1995 Early Formative Period Chronology for the Tucson Basin. *The Kiva* 60(4):481–530.

Debowski, Sharon S., Anique George, Richard Goddard, and Deborah Mullon
1976 *An Archaeological Survey of the Buttes Dam Reservoir*. ASM Archaeological Series No. 93. University of Arizona, Tucson.

Di Peso, Charles C.
1956 *The Upper Pima of San Cayetano del Tumacacori: An Archaeohistorical Reconstruction of the O'otam of Pimería Alta*. Publication No. 7. Amerind Foundation, Dragoon.

Diehl, Michael W.
2005 Epilogue: "Farmaging" during the Early Agricultural Period. In *Subsistence and Resource Use Strategies of Early Agricultural Communities in Southern Arizona*, edited by Michael W. Diehl, pp. 181–184. Anthropological Papers No. 34. Center for Desert Archaeology, Tucson.

Doelle, William H., and Henry D. Wallace
1990 The Transition to History in Pimería Alta. In *Perspectives on Southwestern Prehistory*, edited by P. E. Minnis and C. L. Redman, pp. 239–257. Westview Press, Boulder.

Doyel, David E.
1976 Salado Cultural Development in the Tonto Basin and Globe-Miami Areas, Central Arizona. *Kiva* 42(1):5–16.

1978 *The Miami Wash Project: Hohokam and Salado in the Globe-Miami Area, Central Arizona*. Contributions to Highway Salvage Archaeology in Arizona No. 52. Arizona State Museum, University of Arizona, Tucson.

Elson, Mark D., Miriam T. Stark, and David A. Gregory
2000 Tonto Basin Local Systems: Implications for Cultural Affiliation and Migration. In *Salado*, edited by Jeffrey S. Dean. University of New Mexico Press, Albuquerque.

Emberling, G.
1997 Ethnicity in Complex Societies: Archaeological Perspectives. *Journal of Archaeological Research* 5(4):295–344.

Ezzo, Joseph, and R. Thomas Euler
2004a *A Class III Cultural Resources Survey of 81 Acres of the Whetstone Ranch Property in Cochise County, Arizona.* Cultural Resources Report 04-111. SWCA Environmental Consultants, Tucson.

2004b *Cultural Resources Surveys of the Whetstone Ranch Property, Cochise County, Arizona: A Synthesis Report.* Cultural Resources Report No. 04-137. SWCA, Inc., Tucson.

Ezzo, Joseph A., R. Thomas Euler, and James Steely
2004 *A Historical Properties Treatment Plan for the Whetstone Ranch Property, Cochise County, Arizona.* Cultural Resources Report No. 04-115. SWCA Environmental Consultants, Tucson.

Faught, Michael K., and Andrea K. L. Freeman
1998 Paleoindian Complexes of the Terminal Wisconsin and Early Holocene. In *Paleoindian and Archaic Sites in Arizona*, by Jonathan Mabry, pp. 33–54. Center for Desert Archaeology, Tucson.

Foster, Michael S., John M. Lindly, and Ronald F. Ryden
2004 *Celestials and Soiled Doves: The Archaeology and History of Lots 4–9, Block 13 of Prescott's Original Townsite—The Prescott City Centre Project.* Cultural Resources Report No. 03-386. SWCA Environmental Consultants, Phoenix.

Franklin, Howard H., and W. Bruce Masse
1976 The San Pedro Salado: A Case of Prehistoric Migration. *Kiva* 42(1):47–55.

Freeman, Andrea
1999 Status of the Middle Archaic in Southern Arizona. In *Excavation in the Santa Cruz River Floodplain: The Middle Archaic Component at Los Pozos*, edited by David A. Gregory, pp. 75–84. Anthropological Papers No. 20. Center for Desert Archaeology, Tucson.

Gladwin, Harold S.
1928 *Excavations at Casa Grande, Arizona: February 12–May 1, 1927*. Southwest Museum Papers, Number 2. Los Angeles.

1957 *A History of the Ancient Southwest.* Bond-Wheelwright, Portland.

1965 *Excavations at Snaketown: Material Culture.* University of Arizona Press, Tucson.

Gladwin, Winifred, and Harold S. Gladwin
1935 *The Eastern Range of the Red-on-Buff Culture.* Medallion Papers No. 16. Gila Pueblo, Globe.

Goodman III, John D., Stewart A. Deats, and Jean H. Ballaugh
2005 Introduction and Analysis Methods. In Volume 5, *Historical Artifact Studies and Special Analyses, Carlota Copper Mine Archaeological Project*, pp. 1–9, Cultural Resources Report No. 97-191. SWCA Environmental Consultants, Phoenix.

Goodwin, Grenville
1937 The Characteristics and Function of Clan in a Southern Athapascan Culture. *American Anthropologist* 39:394–407.

1942 *The Social Organization of the Western Apache*. University of Chicago Press, Chicago.

Goodwin, Grenville, and Keith Basso
1971 *Western Apache Raiding and Warfare*. University of Arizona Press, Tucson.

Granger, Byrd H.
1975 *Will C. Barnes' Arizona Place Names*. University of Arizona Press, Tucson.

Gregory, David A.
2001 *Excavations in the Santa Cruz River Floodplain: The Early Agricultural Period Component at Los Pozos*. Anthropological Papers No. 21. Center for Desert Archaeology, Tucson.

Gruner, Erina
2016 *A Cultural Resources Inventory of the 144-Acre Offsite Mitigation Parcel for Clean Water Act Section 404 Permit 2002-00826-SDM, in Benson, Arizona*. Cultural Resources Report 2016-15. WestLand Resources, Inc., Tucson.

Halbirt, Carl D., and T. Kathleen Henderson (eds.)
1993 *Archaic Occupation on the Santa Cruz Flats: The Tator Hills Archaeological Project*. Northland Research, Flagstaff.

Hardesty, Donald L.
2010 *Mining Archaeology in the American Southwest: A View from the Silver State*. University of Nebraska Press, Lincoln.

Haury, Emil W.
1945 *The Excavation of Los Muertos and Neighboring Ruins in the Salt River Valley, Southern Arizona*. Papers of the Peabody Museum of American Archaeology and Ethnology No. 24(1), Cambridge.

1976 *The Hohokam: Desert Farmers and Craftsmen*. University of Arizona Press, Tucson.

1978 Concluding Thoughts. In *The Hodges Ruin: A Hohokam Community in the Tucson Basin*, by Isabel T. Kelly, pp. 126–128. Anthropological Papers No. 30. University of Arizona Press, Tucson.

Heckman, Robert A.
2000 The San Simon Tradition. In *Prehistoric Painted Pottery of Southeastern Arizona*, by Robert A. Heckman, Barbara K. Montgomery, and Stephanie M. Whittlesey, pp. 63–74. Technical Series No. 77. Statistical Research, Inc., Tucson.

Heidke, James M.
2005 Early Agricultural Period Pottery from Las Capas and Los Pozos. In *Material Cultures and Lifeways of Early Agricultural Communities in Southern Arizona*, edited by R. Jane Sliva, pp. 171–206. Anthropological Papers No. 35. Center for Desert Archaeology, Tucson.

Hendricks, David M.
1985 *Arizona Soils.* A Centennial Publication of the College of Agriculture, University of Arizona, Tucson.

Henry, S. L., and P. H. Garrow
1982 The Historic Component. In *City of Phoenix: Archaeology of the Original Phoenix Townsite, Blocks 1 and 2,* edited by J. S. Cable, S. L. Henry, and D. E. Doyel. Soil Systems Publications in Archaeology No. 1, pp. 181–382. Professional Service Industries, Inc., Phoenix.

Hohman, John W.
1992 An Overview of Salado Heartland Archaeology. In *Proceedings of the Second Salado Conference, Globe, Arizona, 1992*, edited by R. C. Lange and S. Germick, pp. 1–16. Occasional Paper. Arizona Archaeological Society, Phoenix.

Holmes, Amy
2007 Memorandum for Record for SWCA: Comments on *A Historic Properties Treatment Plan for the Whetstone Ranch Property, Cochise County, AZ*. U.S. Army Corps of Engineers, Los Angeles District.

Horning, Audrey J.
2000 Archaeological Considerations of "Appalachian" Identity. In *The Archaeology of Communities: A New World Perspective*, edited by Marcello A. Canuto and Jason Yaeger, pp. 210–230. Routledge, London.

Huckell, Bruce B.
1982 *The Distribution of Fluted Points in Arizona: A Review and an Update.* Arizona State Museum Archaeological Series No. 145. University of Arizona, Tucson.

1984 The Paleoindian and Archaic Occupation of the Tucson Basin: An Overview. *The Kiva* 49:133–145.

1996 The Archaic Prehistory of the North American Southwest. *Journal of World Prehistory* 10(3):305–372.

Irwin, G. W.
1987 A Sequential History of Arizona Railroad and Mining Development, 1964–1920. In *History of Mining in Arizona, Volume 1*, edited by J. Michael Canty and Michael N. Greeley, pp. 253–278. American Institute of Mining Engineers and Southwestern Minerals Exploration Association, Tucson.

Jones, Jeffrey T.
2000 *Cultural Resources Survey of 960 Acres for Whetstone Ranch North Forty Project East of State Route 90 and South of Interstate Highway 10 near Benson in Cochise County, Arizona.* Letter Report No. 2000.040. Old Pueblo Archaeology Center, Tucson.

2001 *Assessment of Three Historical Archaeological Sites on the Whetstone Ranch in Benson, Arizona.* Letter Report 2001.007. Old Pueblo Archaeology Center, Tucson.

Jones, Jeffrey T., and Allen Dart
2001a *Cultural Resources Survey of 1437.45 Acres on the Whetstone Ranch Property East of and Including Part of State Route 90 in and Adjacent to Benson, Arizona.* Letter Report 2002.028. Old Pueblo Archaeology Center, Tucson.

2001b *The El Paso and Southwestern Railroad in Benson, Arizona. Railway Features and Artifacts on the Whetstone Ranch and Arizona State Trust Properties.* Technical Report Number 2001.002. Old Pueblo Archaeology Center, Tucson.

2003 *Cultural Resources Survey of 4,781.92 Acres in T17S, R20E, Section 33, and T18S, R20E, Sections 3, 5, 7, 8, 9, 10, 15, 16, 17, and 18, G&SRB&M, Benson, Arizona.* Letter Report 2003.015. Old Pueblo Archaeology Center, Tucson.

Jones, Siân
1997 *The Archaeology of Ethnicity: Constructing Identities in the Past and Present.* Routledge, New York.

Kahldahl, Eric, Jeffrey T. Jones, and Allen Dart
2001 *Cultural Resources Survey of 160 Acres Proposed for a Wastewater Treatment Plant Development in Benson, Cochise County, Arizona.* Letter Report 2001.043. Old Pueblo Archaeology Center, Tucson.

Kelley, J. Charles
1991 The Known Archaeological Ballcourts of Durango and Zacatecas, Mexico. Chapter 5 in *The Mesoamerican Ballgame*, edited by Vernon L. Scarborough and David R. Wilcox. University of Arizona Press, Tucson.

Lekson, Stephen H.
2002 *Salado Archaeology of the Upper Gila, New Mexico.* University of Arizona Press, Tucson.

Lindly, John M.
2012 *Historic Properties Treatment Plan for Six Sites on the 8,200-Acre Whetstone Ranch Property near Benson, Cochise County, Arizona.* Cultural Resources Report 2012-3. WestLand Resources, Inc., Tucson.

Lockhart, Bill, Pete Schulz, Carol Serr, Bill Lindsey, and David Whitten
2007 The Dating Game: The American Bottle Co., a Study in Contracts and Contradictions. In *Bottles and Extras* 18(1):47–58.

Mabry, Jonathan B.
1998 *Paleoindian and Archaic Sites in Arizona*. Center for Desert Archaeology, Tucson.

2005 Diversity in Early Southwestern Farming and Optimization Models of Transition to Agriculture. In *Subsistence and Resource Use Strategies of Early Agricultural Communities in Southern Arizona*, edited by Michael W. Diehl, pp. 113–152. Anthropological Papers No. 34. Center for Desert Archaeology, Tucson.

Masse, W. Bruce
1980 Introduction to the Peppersauce Wash Project. In *The Peppersauce Wash Project: Excavations at Three Multicomponent Sites in the Lower San Pedro Valley, Arizona*, by Bruce Masse. Contributions to Highway Salvage Archaeology in Arizona 53: Appendix F. MS. Arizona State Museum Library, University of Arizona, Tucson.

1981 A Reappraisal of the Protohistoric Sobaipuri Indians of Southeastern Arizona. In *The Protohistoric Period in the American Southwest, A.D. 1450–1700*, edited by D. R. Wilcox and W. B. Masse, pp. 28–56. Anthropological Research Papers No. 29. Arizona State University, Tempe.

Medley, Jo Anne
2004 *Letter to Ms. Lester: Whetstone Ranch Development*. AZ File No. 2003-00826-SDM; DOD-Corps; SHPO 2004-0900. State Historic Preservation Office, Arizona State Parks Department.

Morrisey, Richard J.
1950 The Early Range Cattle Industry in Arizona. *Agricultural History* 24(2):151–156.

Neily, Robert B.
1985 *The Snowflake-Redonda Project: An Intensive Archaeological Survey in the Upper Little Colorado River Area of East-Central Arizona*. Cultural Resource Management Division, Arizona State Museum, University of Arizona, Tucson.

Netting, Robert, Robert R. Wilk, and Eric Arnould (eds.)
1984 *Households: Comparative Historical Studies of the Domestic Group*. University of California Press, Berkeley.

Noble, Bruce J., Jr., and Robert Spude
1997 *Guidelines for Identifying, Evaluating, and Registering Historic Mining Properties*, revised from 1992 edition. National Register Bulletin 42, U.S. Department of the Interior, National Park Service, Washington D.C.

Pyszczyk, H.
1989 Consumption and Ethnicity: An Example from the Fur Trade in Western Canada. In *The Journal of Anthropological Archaeology* 8(3):213–249.

Reid, Jefferson, and Stephanie Whittlesey
1997 *The Archaeology of Ancient Arizona*. University of Arizona Press, Tucson.

Rice, Glen E.
1998 Migration, Emulation, and Tradition in Tonto Basin Prehistory. In *A Synthesis of Tonto Basin Prehistory: The Roosevelt Archaeological Studies, 1989–1998*, edited by Glen E. Rice, pp. 231–241. Roosevelt Monograph Series No. 12, Anthropological Field Studies No. 41. Office of Cultural Resource Management, Arizona State University, Tempe.

Rickard, Forrest R.
1987 History of Smelting in Arizona. In *History of Mining in Arizona, Volume 1*, edited by J. Michael Canty and Michael N. Greeley, pp. 191–228. American Institute of Mining Engineers and Southwestern Minerals Exploration Association, Tucson.

Saxton, Dean, and Lucille Saxton
1973 *O'othham Hoho'ok A'agitha: Legends and Lore of the Papago and Pima Indians*. University of Arizona Press, Tucson.

Sayles, E. B., and Ernst Antevs
1941 *The Cochise Culture*. Lancaster Press, Inc., Lancaster.

Schroeder, Albert
1953 The Problem of the Hohokam, Sinagua, and Salado Relations in Southern Arizona. *Plateau* 26(2):75–83.

Seymour, Deni J.
2007 *An Archaeological Perspective on the Hohokam-Pima Continuum*. Bulletin No. 51. Old Pueblo Archaeology Center, Tucson.

Seymour, Gregory R., Richard V. N. Ahlstrom, and David P. Doak
1997 *The Sanchez Copper Project. Vol. 1: Archaeological Investigations in the Safford Valley, Graham County, Arizona*. Archaeological Report No. 94-82. SWCA, Inc., Environmental Consultants, Tucson.

Slaughter, Mark C.
1992 Flaked Stone in Arizona. In *Making and Using Stone Artifacts: A Context for Evaluating Lithic Sites in Arizona*, by Mark C. Slaughter, Lee Fratt, Kirk Anderson, and Richard V. N. Ahlstrom, pp. 2.1–2.12. Prepared by SWCA, Tucson. Distributed by the Arizona State Historic Preservation Office, Phoenix.

Sonnichsen, C. L.
1987 *Tucson: The Life and Times of an American City*. University of Oklahoma Press, Norman.

South, Stanley
1977 Method and Theory in Historical Archaeology. Academic Press, New York.

Spicer, Edward H.
1962 *Cycles of Conquest: The Impact of Spain, Mexico, and the United States on the Indians of the Southwest, 1533–1960*. University of Arizona Press, Tucson.

Stark, Miriam T., Jeffery J. Clark, and Mark D. Elson
1995 Causes and Consequences of Migration in the 13th Century Tonto Basin. *Journal of Anthropological Archaeology* 14:212–246.

Stein, Pat H.
1990 *Homesteading in Arizona 1870–1942*. A Component of the Arizona Historic Preservation Plan. State Historic Preservation Office/Arizona State Parks, Phoenix.

1994 *Historic Trails in Arizona from Coronado to 1940*. A Component of the Arizona Historic Preservation Plan. SWCA, Flagstaff.

Stevens, Michelle N., and R. Jane Sliva
2002 Empire Points: An Addition to the San Pedro Phase Lithic Assemblage. *Kiva* 67(3):297–326.

Stinson, Susan L.
2005 Other Artifacts of Clay from Las Capas and Los Pozos. In *Material Cultures and Lifeways of Early Agricultural Communities in Southern Arizona*, edited by R. Jane Sliva. Anthropological Papers No. 35. Center for Desert Archaeology, Tucson.

Teague, Lynn S.
1993 Prehistory and the Traditions of the O'odham and Hopi. *The Kiva* 58(4):435–454.

Thiel, J. Homer
1998 *Phoenix's Hidden History: Archaeological Investigation at Blocks 72 and 73*. Anthropological Papers No. 7, Pueblo Grande Museum. City of Phoenix Parks, Recreation, and Library Department.

Toulouse, Julian Harrison
1972 *Bottle Makers and their Marks*. Thomas Nelson, Inc., New York.

U.S. Army Corps of Engineers
2017 Memorandum for Record: National Environmental Policy Act Scope of Analysis and Endangered Species Act Action Area for the Phase I Villages at Vigneto Community Master Plan Area (Permit #SPL-2003-00826).

Vanderpot, Rein, and Jeffrey H. Altschul
2007 The Mescal Wash Site: A Persistent Place in Southeastern Arizona. In *Hinterlands and Regional Dynamics in the Ancient Southwest*, edited by Alan P. Sullivan and James M. Bayman, pp. 50–108. University of Arizona Press, Tucson.

Walker, Henry P., and Don Bufkin
1979 *Historical Atlas of Arizona*. University of Oklahoma Press, Norman.

Wasley, William W.
1966 *Classic Period Hohokam*. Paper presented at the 31st Annual Meeting of the Society for American Archaeology, Reno.

Weaver, Donald E., Jr.
1976 Salado Influences in the Lower Salt River Valley. *Kiva* 42(1):17–26.

Wenker, Chris T.
1996 *Class III Cultural Resources Inventory of 2,340 Acres of Private Land in Cochise County, Arizona.* Archaeological Report No. 96-29. SWCA Environmental Consultants, Tucson.

Whittlesey, Stephanie M.
2003 *Rivers of Rock: Stories from a Stone-Dry Land: Central Arizona Project Archaeology*. SRI Press, Tucson.

Whittlesey, Stephanie M., and J. Jefferson Reid
1982 Cholla Project Perspectives on Salado. In *Cholla Project Archaeology: Vol. 1. Introduction and Special Studies*, edited by J. J. Reid, pp. 63–80. Archaeological Series No. 161. Arizona State Museum, University of Arizona, Tucson.

Whittlesey, Stephanie M., and Richard Ciolek-Torrello
1992 A Revolt against Rampant Elites: Toward an Alternative Paradigm. In *Proceedings of the Second Salado Conference, Globe, AZ, 1992*, edited by Richard C. Lange and Stephen Germick, pp. 312–324. Occasional Paper. Arizona Archaeological Society, Phoenix.

Whittlesey, Stephanie M., and Robert A. Heckman
2000 Concluding Thoughts. In *Prehistoric Painted Pottery of Southeastern Arizona.* Robert A. Heckman, Barbary K. Montgomery, and Stephanie Whittlesey. Technical Series 77. Statistical Research, Inc., Tucson.

Whittlesey, Stephanie M., R. Ciolek-Torrello, and Matthew A. Sterner
1994 Prehistory of the San Pedro River Valley. In *Southern Arizona: The Last 12,000 Years: A Cultural-historic Overview for the Western Army National Guard Aviation Training Site*, by S. M. Whittlesey, R. S. Ciolek-Torrello, and M. A. Sterner, pp. 45–108. Technical Series 48. Statistical Research, Tucson.

Wilcox, David R., and Charles Sternberg
1983 *Hohokam Ballcourts and Their Interpretation.* Arizona State Museum Archaeological Series No. 160. University of Arizona, Tucson.

Wilk, Richard R.
1990 The Built Environment and Consumer Decisions. In *Domestic Architecture and the Use of Space: An Interdisciplinary Cross-cultural Study*, edited by Susan Kent, pp. 34–42. Cambridge University Press, Cambridge, U.K.

Wilk, Richard R. (ed.)
1989 *The Household Economy. Reconsidering the Domestic Mode of Production*. Westview, Boulder.

Wilson, John P.
1999 *Peoples of the Middle Gila: A Documentary History of the Pimas and Maricopas, 1500s–1945*. Report No. 77. Researched and written for the Gila River Indian Community, Sacaton, Arizona, 1998 (Revised 1999). Las Cruces.

Woodson, M. Kyle
1999 Migrations in Late Anasazi Prehistory: The Evidence from the Goat Hill Site. *Kiva* 65:63–84.

2006 The Goat Hill Site and Ancestral Pueblo Migrations into the Safford Basin. *Archaeology Southwest* 20(2):4.

APPENDIX A

U.S. ARMY CORPS OF ENGINEERS
AND
ARIZONA STATE HISTORIC PRESERVATION OFFICE
COMMENTS ON
WHETSTONE RANCH HPTP

US Army Corps of Engineers®

Memorandum for Record

TO: Joe Ezzo and Tom Euler, SWCA, Inc.
CC: Sallie McGuire, Los Angeles District,
Jo Anne Medley, SHPO
FROM: Amy Holmes, Los Angeles District
Date: October 25, 2007

RE: Comments on *A Historic Properties Treatment Plan for the Whetstone Ranch Property, Cochise County, AZ* (March 21, 2007)

I reviewed the draft report, *A Historic Properties Treatment Plan for the Whetstone Ranch Property, Cochise County, AZ* (March 21, 2007). In addition, I reviewed the following correspondence between the Arizona State Historic Preservation Office (SHPO) and the US Army Corps of Engineers (Corps):

- Letter from Jo Anne Medley to Cindy Lester, June 11, 2004
- Email from Jo Anne Medley to Lydia Lopez-Cruz, March 9, 2005

My comments are as follows:

1. After looking at this document, I do not feel that you understand the purpose of the Historic Properties Treatment Plan (HPTP). The purpose of the HPTP is to present a treatment/data recovery plan to mitigate the adverse effects of the project undertaking on the historic properties located within the project's Area of Potential Effects (APE). The purpose is not archaeological testing and site eligibility determination. Recall that the Corps, in consultation with the SHPO, **has already determined** that the following sites are eligible for the National Register and are within the APE: AZ AA:12:875 (ASM), AZ EE:3:74 (ASM), AZ EE:3:166 (ASM), AZ EE:3:172, and AZ EE:3:175. Also recall that SHPO has stated that "In this case, eligibility testing would not be required and data recovery would be **one of the required treatment measures to mitigate adverse effects**" (letter from Jo Anne Medley to Cindy Lester, June 11, 2004, enclosed). Please review SHPO Guidance Point No. 2, *SHPO Position on the Roles of Archaeological Testing*, for an explanation of the difference between testing and data recovery. I have enclosed a copy for your reference. Please delete all references to site testing in the document. Revise the document to reflect your understanding that the purpose of the HPTP is the mitigation of historic properties.

2. Site AZ AA:12:875(ASM) should not be included in the HPTP because it is exempt from treatment pursuant to the Advisory Council on Historic Preservation's notice dated April 5, 2002 (Federal Register Vol. 67, No. 66), not because HABS/HAER documentation has been completed on it (see page iii, paragraph 3, sentence 4). However, you need to explain this to the reader in the Management Summary. Please insert a few sentences into the Management Summary stating why site AZ AA:12:875 (ASM) is exempt and include a citation to the Federal Register Vol. 67, No. 66. This will allow the reader to understand why this historic property located within the APE does not require treatment in the HPTP.

3. The Management Summary and Introduction should briefly describe each of the four eligible sites and state their respective criteria of eligibility. For example, *Site AZ EE:3:74 (ASM), the El Paso and Southwestern Railroad, has been determined eligible for the National Register under Criterion A and C. Adverse effects to this property will be mitigated through the use of interpretive signage and an exhibit in the common areas of the development.*

4. The document should be revised to resemble a standard HPTP. Remember that the HPTP is a stand-alone document, and a brief description of environmental and cultural contexts is necessary. I have enclosed an example HPTP outline for your reference.

5. Remove Figure 2. This map is not relevant to the document (see SHPO comment, e-mail from Jo Anne Medley to Lydia Lopez-Cruz, March 9, 2005).

6. Make Figure 3 the new Figure 2. This map should show the historic properties in relation to the APE. This map should still show the location of AZ AA:12:875 (ASM). Make sure all map symbols are called out in the Key.

7. Remove Table 1- not relevant.

8. Make Table 2 the new Table 1, and revise it to summarize only sites AZ EE:3:74 (ASM), AZ EE: 3:166 (ASM), AZ EE:3:172 (ASM), and AZ EE:3:175 (ASM).

9. Include site sketch maps for AZ EE:3:74 (ASM), AZ EE:3:166 (ASM), AZ EE:3:172 (ASM), and AZ EE:3:175 (ASM) and reference these maps in the site descriptions (see SHPO comment, e-mail from Jo Anne Medley to Lydia Lopez-Cruz, March 9, 2005).

10. Both historic and prehistoric contexts should be better developed. The document does not reference the pertinent SHPO context documents. Please refer to SHPO comments regarding historic contexts (see SHPO comment, e-mail from Jo Anne Medley to Lydia Lopez-Cruz, March 9, 2005).

11. The El Paso and Southwestern Railroad should only be referred to as site AZ EE:3:74 (ASM), not AZ EE:3:43 (ASM) or AZ EE:3:58 (ASM). Please revise sentence 1, paragraph 4 on page 9 to reflect this. This is consistent with SHPO Comment # 2 (see Letter from Jo Anne Medley to Cindy Lester, June 11, 2004).

12. The document should describe the historic properties in relation to the project APE, not the project area. APE and project area are not synonymous.

13. Page 14, first sentence: Please change "MOA" to "Burial Agreement". The Burial Agreement will be between the Arizona State Museum, Permittee/Applicant, and Native American groups.

Please make sure that you review and address these comments as wells the previous comments from SHPO (enclosed). Feel free to contact me if you have any questions.

Enclosures

Arizona State Parks

"Managing and conserving natural, cultural, and recreational resources"

In reply refer to SHPO-2004-0900
General Comments

June 11, 2004

Cindy Lester, Chief, Arizona Section
Regulatory Branch
U.S. Army Corps of Engineers
3636 North Central Avenue, Suite 900
Phoenix, AZ 85012-1939

Arizona State Parks
1300 W. Washington
Phoenix, AZ 85007

Tel & TTY: 602.542.4174
www.azstateparks.com

800.285.3703 from
(520 & 928) area codes

General Fax:
602.542.4180

Director's Office Fax:
602.542.4188

Attention: Sallie McGuire

Re: Whetstone Ranch, Benson, AZ; File No. 2003-00826-SDM; DOD-Corps **SHPO-2004-0900** (20045)

Dear Ms. Lester:

Thank you for consulting with our office pursuant to 36 CFR 800 about the above referenced federal undertaking, and for providing copies of six cultural resources survey reports, a synthesis report of those surveys, a report of the results of data recovery done at three sites, and a draft testing and data recovery plan. William Collins, Historian and Jo Anne Medley, Archaeologist have reviewed the documentation submitted and have the following comments:

1. Cultural Resources Surveys of the Whitestone Ranch Property, Cochise County Arizona: A Synthesis Report (April 12, 2004) was very helpful in streamlining review and is much appreciated.
2. The surveys of ca. 9,360 acres on the Whetstone Ranch Property in Cochise County, AZ recorded 34 archaeological sites. The actual number of sites needs clarification and revision:
   a) The Arizona State Museum (ASM) has consolidated all the site numbers attributed by various surveys to segments and features of the abandoned El Paso and Southwestern Railroad into one site number: AZ EE:3:74(ASM). ASM site numbers AZ EE:3:43 and AZ EE:3:58 are eliminated from the list of sites for this undertaking.
   Information regarding consolidation of site numbers for linear historic properties is available at http://azsite.asu.edu/news/linears.htm.
   b) The location of historic period site AZ EE:3:57 is plotted in different places (Figure 3) by SWCA's survey and by Old Pueblo's survey. There are also differences in artifact categories recorded in the two reports. These discrepancies must be resolved to determine whether this is one site or two. Both site locations must be revisited and the site(s) described and evaluated for Register-eligibility.

3. In 2003, and under site number AZ EE:3:43, the El Paso and Southwestern Railroad [AZ EE:3:74(ASM)] was determined eligible for inclusion in the Arizona/National Register of Historic Places under Criteria A and C. Tracks and ties are absent from the railbed and its integrity along the lengths inspected is described by various reports as ranging from good (grade not impacted by erosion or construction and ballast present) to poor.
4. Archaeological sites related to railway construction are present along the railroad grade. Work camp sites AZ EE:3:57, AZ EE:3:166, and AZ EE:3:168 have Criteria A and C association but do not have the integrity to qualify for eligibility under those Criteria.
5. In consultation between the Federal Energy Regulatory Commission (FERC) and SHPO, El Paso Gas Pipeline No. 1007 [AZ AA:12:875(ASM)] has been determined Register-eligible under Criteria A and C.
6. The statement (pg. 7), "Although the State of Arizona might consider the pipeline important enough to merit cultural resource study...," attributed to Jones and Dart (2003:10) is ill-informed. HABS-HAER documentation of the pipeline has been completed as a result of the FERC-SHPO consultation. Further, Jones and Dart's eligibility recommendation (ineligible) for Pipeline No. 1007 is incorrect. The property remains Register-eligible. The authors are correct, however, in that no additional cultural resource work related to the pipeline would be necessary, both because HABS-HAER has been completed and because of the April 5, 2002 exemption for historic natural gas pipelines.
7. Although the Corps has not yet made eligibility determinations, based on these several reports, it is our opinion that:
   a) Railroad related archaeological sites AZ EE:3:57, AZ EE:3:166, and AZ EE:3:168(ASM) are Register-eligible under Criterion D.
   b) Archaic period sites AZ EE:3:172, AZ EE:3:173, and AZ EE:3:175(ASM) are Register eligible under Criterion D.
   c) The following historic/modern period sites are not Register-eligible: AZ EE:3:163, AZ EE:3:165, AZ EE:3:167, AZ EE:3:169, AZ EE:3:170, AZ EE:3:171, AZ EE:3:174, AZ EE:3:177, AZ EE:3:178, AZ EE:3:180, AZ EE:3:181, and AZ EE:3:182(ASM).
   c) Prehistoric sites AZ EE:3:10, AZ EE:3:55, AZ EE:3:56, AZ EE:3:162, AZ EE:3:177, AZ EE:3:179, and AZ EE:3:86(ASM) are not Register eligible.
   d) Data recovery has been done at historic period sites AZ EE:3:84, AZ EE:3:86, and AZ EE:3:87(ASM) (Jones and Dart 2001); no additional archaeological work is necessary.
   e) AZ EE:3:57 must be appropriately identified and evaluated to determine number of sites and eligibility under Criterion D.
9. A finding of adverse effect is warranted for this undertaking.
8. Please inform us of the results of your consultation with tribes that claim cultural affinity in the project area.

10. Our records indicate that a portion of the Arizona Trail may cross through some portion of the Whetstone Ranch Property. It is likely that the Arizona Trail or other trails related to Whetstone Ranch development may follow along the railroad grade. We recommend that mitigation for adverse effects on AZ EE:3:74 (Register-eligible under Criteria A and C) include interpretation and signage and perhaps an exhibit in common areas of the development.
11. The draft testing and data recovery plan should be revised to take into account eligibility determinations made by the Corps in consultation with SHPO. Criteria of eligibility are critical in choice of treatment measures. In this case, eligibility testing would not be required and data recovery would be one of the required treatment measures to mitigate adverse effects.
12. Because historic properties identified within the area of potential effect (APE) for this undertaking are eligible under several Criteria, the treatment plan should identify mitigation measures for properties eligible under Criterion A and C and how they will be implemented, based on the recommendations in comment number 10. If Tribes identify properties of cultural value within the APE, the plan also would need to identify appropriate treatment for those properties.
13. We recommend that the revised plan be titled "A Historic Properties Treatment Plan for ..." which would be applicable also for properties eligible under Criteria other than D.
14. Pursuant to 36 CFR 800.6, a Memorandum of Agreement (MOA) should be developed. The MOA should include a Stipulation(s) specific to historic period properties and their treatment.

We look forward to continuing to consult on this undertaking. If you have any questions or concerns, please contact Dr. Collins (602-542-7159) or me (602-542-7142).

Sincerely,

Jo Anne Medley
Compliance Specialist/Archaeologist
State Historic Preservation Office

cc: Steve Dibble, DOD-Corps, Los Angeles
Tom Euler, SWCA, Tucson

APPENDIX B

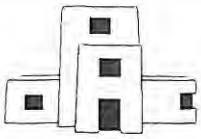
THE EL PASO AND SOUTHWESTERN RAIL ROAD IN BENSON, ARIZONA

THE EL PASO AND SOUTHWESTERN RAIL ROAD IN BENSON, ARIZONA

RAILWAY FEATURES AND ARTIFACTS ON THE WHETSTONE RANCH AND ARIZONA STATE TRUST PROPERTIES

(ASLD Application No. 16-106247)
(Rural Utilities Services File No. SHPO-2000-2695)

Jeffrey T. Jones
Allen Dart



Old Pueblo Archaeology Center
Technical Report Number 2001.002

Old Pueblo Archaeology Center
1000 E. Fort Lowell Road, Tucson, Arizona
Mailing Address: PO Box 40577, Tucson AZ 85717-0577
(520) 798-1201
Fax (520) 798-1966
An Arizona Nonprofit Corporation

THE EL PASO AND SOUTHWESTERN RAIL ROAD IN BENSON, ARIZONA

Railway Features and Artifacts on the Whetstone Ranch and Arizona State Trust Properties (ASLD Application No. 16-106247) (Rural Utilities Services File No. SHPO-2000-2695)

Jeffrey T. Jones
Allen Dart

Submitted to:

WestLand Resources, Inc.
2343 E. Broadway Blvd. Suite 202
Tucson AZ 85719

Old Pueblo Archaeology Center
Technical Report No. 2001.002

Allen Dart, Principal Investigator

2001

Abstract

AGENCY/LAND OWNERSHIP: Arizona State Land Department/Arizona State Trust land administered by the Arizona State Land Department (Section 28, T17S, R20E only) and Army Corps of Engineers/Whetstone Construction Co., L.L.C.

PERMIT NUMBER(S): Arizona State Museum project specific permit No. 2001-49ps

STATE LAND DEPARTMENT APPLICATION NUMBER: 16-106247

RURAL UTILITIES SERVICES FILE NUMBER: RUS SHPO-2000-2695 (Job No. 460.05)

PROJECT TITLE: Old Pueblo Archaeology Center project no. 2001003, Cultural resources assessment of the portion of AZ EE:3:43 (ASM), the El Paso and Southwestern Rail Road, on the Whetstone Ranch property (WRRT)

PROJECT DESCRIPTION: Surface collection of a representative sample of surface artifacts and mapping and photography of all archaeological features within the portion of the El Paso and Southwestern Rail Road right of way on the Whetstone Ranch property (including State Trust land) in Benson, Arizona

LOCATION: The inspected area is a 200-ft-wide corridor centered on the abandoned railroad bed that is shown on the USGS Benson (1973, PR1983) and McGrew Spring (1983) 7.5-minute topographic maps southwest of Benson, beginning at the northern boundary of Section 29, T17S, R20E, and running south-southeastward to the eastern boundary of Section 15, T18S, R20E, G&SRB&M, Cochise County, Arizona. The portion of the corridor in Section 28, T17S, R20E, is State Trust land and the rest is privately owned.

INSTITUTION/CONSULTANT: Old Pueblo Archaeology Center: Allen Dart, principal investigator; Jeffrey T. Jones, project director, Michael Cook, field assistant

DATES OF FIELDWORK/PERSON-DAYS EXPENDED: January 22, 25, and 26, 2001/4.375 field person-days

SIZE OF INVESTIGATED AREA: 109.82 acres (44.44 hectares)

REGISTER-ELIGIBLE SITES: None

REGISTER-INELIGIBLE SITES: AZ EE:3:43 (ASM); AZ AA:12:875 (ASM)

PROJECT SUMMARY AND RECOMMENDATIONS: On January 22, 25, and 26, 2001, Old Pueblo Archaeology Center conducted a cultural resources study at the portion of archaeological site AZ EE:3:43 (ASM), the El Paso and Southwestern Rail Road, located on the Whetstone Ranch property. The primary purpose of the project was to make a record and interpretation of the visible archaeological features and artifacts at the site in order to mitigate any effects that development of the property might have on these archaeological features. To this end 27 concrete culverts, 5 signal flag foundations, 1 possible sign or light pedestal, 1 bridge, 1 possible camp site, 1 solder-top can concentration, 1 asphalt diversion dam, and 1 earthen unloading ramp with an associated temporary siding were mapped and photographed. In addition to mapping and photographing surface features, a representative sample of historical artifacts was collected from the surface. (No artifacts were collected from State Trust Land).

Old Pueblo Archaeology Center recommends that the project sponsor be allowed to utilize and develop the investigated portion of the El Paso and Southwestern Rail Road on the Whetstone Ranch property with no obligation for additional cultural resource studies.

Table of Contents

Abstract 3
List of Figures 6
List of Tables 6
About the Authors 6

Chapter 1: Testing Project Background and Investigation Methods *Jeffrey T. Jones and Allen Dart* 7

Project Setting 8
Location and Environment 8
Cultural Setting: Summary of Culture History 8
Spanish Colonial Period (1691-1821) 8
Mexican Period (1821-1854) 9
The Gadsden Purchase (1854) and the Territorial Period (1863-1912) 9
Statehood (1912 and Later) 9
The El Paso and Southwestern Rail Road 9
AZ AA:12:875 (ASM), El Paso Natural Gas Company Pipeline No. 1007 10
Previous Archaeological Research in the Project Vicinity 10
Investigation Methods 11

Chapter 2: Cultural Features *Jeffrey T. Jones* 15

El Paso and Southwestern Rail Road Features on State and Private Land 15
Railroad Features on State Trust Land (Section 28, T17S, R20E) 15
Railroad Features on Privately Owned Land 16
El Paso Natural Gas Company Pipeline No. 1007 Intersection
With Portion of Railroad Corridor on Private Land 17

Chapter 3: Artifacts from AZ EE:3:43 (ASM) *Jeffrey T. Jones* 39

Artifacts Collected and Artifacts That Were Only Field-recorded 39
Feature 3, Possible Camp Site 39
Feature 27, Possible Dump Site 40
Feature 37, Ramped Loading Dock 40
Vicinity of Feature 17 40
Nonfeature Area South of Pipeline No. 1007 40
Discussion 41

Chapter 4: Summary, Conclusions, Significance, and Recommendations *Jeffrey T. Jones* 45

The El Paso and Southwestern Rail Road 45
The Whetstone Ranch Portion of the El Paso and Southwestern Rail Road 47
Conclusions 48
Evaluation of Significance 48
Evaluation Criteria 48
Significance Assessment 48
Recommendations 49

References Cited 51

List of Figures

1.1 Reduced-scale copy of portions of the USGS Benson and McGrew Spring, Arizona, 7.5-minute topographic maps showing project area and sites AZ EE:3:48 (ASM) and AZ AA:12:875 (ASM) 12
1.2 Comparative cultural sequences for south-central Arizona 13
2.1 Project area and location of Features 1-7, 36, and 37 18
2.2 Project area and location of Features 8-14 19
2.3 Project area and location of Features 15-20 20
2.4 Project area and location of Features 20-25 21
2.5 Project area and location of Features 25-32 including the only cultural features recorded on State Trust land in Section 28 (Features 28, 29, and 30) 22
2.6 Project area and location of Features 31-34 23
2.7 Photograph of large arched culvert Feature 28 24
2.8 Photograph of signal flag foundation Feature 29 24
2.9 Photograph of bridge Feature 30 25
2.10 Plan and elevation drawing of bridge Feature 30 25
2.11 Photograph of small arched culvert with straight abutments, Feature 17 26
2.12 Plan and elevation drawing of small arched culvert Feature 17 27
2.13 Plan and elevation drawing of large arched culvert Feature 10 28
2.14 Photograph of washed-out arched culvert Feature 21 showing construction methods 29
2.15 Plan and elevation drawing of box culvert Feature 20 30
2.16 Photograph of concrete pedestal Feature 22 31
2.17 Photograph of historical can concentration at Feature 3 31
2.18 Photograph of temporary siding Feature 2 looking south from north end 32
2.19 Photograph of loading dock Feature 37 32
2.20 Photograph of cattle guard foundation at Feature 37 33
2.21 Photograph of solder-top can concentration Feature 27 34
2.22 Photograph of El Paso Natural Gas Co. Pipeline No. 1007 gate 35

List of Tables

2.1 Investigated El Paso and Southwestern Rail Road features on State Trust Land 36
2.2 Investigated El Paso and Southwestern Rail Road features on Whetstone Ranch private land 37
3.1 Artifacts collected from the El Paso and Southwestern Rail Road bed and right of way 42
3.2 Inventory of artifacts observed but not collected 43

About the Authors

Jeffrey T. Jones, an archaeologist, is a Project Director, archaeological field school instructor, and mapping specialist for Old Pueblo Archaeology Center.

Allen Dart, an archaeologist, is Principal Investigator and Executive Director of Old Pueblo Archaeology Center.

Chapter 1

Project Background and Investigation Methods

Jeffrey T. Jones and Allen Dart

On January 22, 25, and 26, 2001, Old Pueblo Archaeology Center archaeologist Jeffrey T. Jones, assisted by archaeology technician Michael D. Cook, conducted a cultural resources study for WestLand Resources, Inc., to document potentially significant cultural materials along the portion of the El Paso and Southwestern Rail Road (EP&SW) bed and right of way on the Whetstone Ranch property (which includes leased State Trust land) in Benson, Arizona. The EP&SW has been designated AZ EE:3:43 (ASM) by the Arizona State Museum, University of Arizona. The purpose of Old Pueblo's study was to determine whether any significant cultural materials are present at the investigated site, according to eligibility criteria for historic properties to be listed in the National Register of Historic Places, and to provide a thorough record and interpretation of such materials in order to mitigate any effects that future use and development might have on this cultural resource. This report offers some background to Old Pueblo's 2001 cultural resources study program at the EP&SW bed and right of way, describes the purposes of the project, and presents and interprets the project findings.

Approximately 2,800 ft of the EP&SW right of way in Section 28, T17S, R20E, is located on State-owned (Arizona State Trust) land and was investigated under project-specific archaeological permit 2001-49ps issued by the Arizona State Museum for Arizona State Land Department (ASLD) Application No. 16-106247. The remaining portions of the road bed were located entirely on private property within the Whetstone Ranch, where no project-specific archaeological permit was required. The property owners, Whetstone Construction Co., L.L.C., agreed to donate all recovered archaeological material and field records to the Arizona State Museum for permanent curation upon completion of this study.

This EP&SW railroad corridor recording project is one of several studies performed by Old Pueblo Archaeology Center to assist in managing cultural resources that might be affected by the proposed land developments on the Whetstone Ranch. The sponsors of all of these studies propose to install water, sewer, and power lines in the 200-ft-wide EP&SW corridor. An initial cultural resources survey of all of the EP&SW corridor discussed in this report except its northwest end in privately owned Section 29 was conducted in October 2000 (Jones 2000c). Only the segment that is within Section 29 is proposed to contain an electric power line, so cultural features of the EP&SW in that section (Figure 1.1) are subject to review by the Rural Utilities Services (RUS) agency and the State Historic Preservation Office (SHPO) on RUS's behalf. The Section 29 segment of the EP&SW corridor is a central segment of a 3.10-mile by 200-ft the proposed power line corridor that extends northwestward from Section 29 into Sections 19 and 20 and southeastward from Section 29 into Sections 32 and 33, on courses that diverge from the EP&SW corridor outside of Section 29. Old Pueblo's initial cultural resources surveys for this power line are reported by Jones (2000b) and Dart (2001).

Part of the EP&SW corridor passes through Section 28, which is Arizona State Trust land, so the portion of this study that deals with Section 28 is subject to review by the Arizona State Land Department and the SHPO. The Section 28 segment of the EP&SW corridor will not contain any power lines so treatment of cultural features in that segment is not subject to RUS review.

Most of the EP&SW corridor discussed in this report also passes through portions of the Whetstone Ranch property for which an 868.58-acre cultural resource survey for "The Canyons" proposed land

development, and a 960-acre survey for the "North Forty" proposed development, have been conducted by Old Pueblo (Jones 2000a, 2000d) and for which further cultural resource documentation studies have been initiated.

Figures and tables are organized by chapter and are presented at the end of each chapter.

PROJECT SETTING

LOCATION AND ENVIRONMENT

The inspected area is a 28,902-ft-long, 200-ft-wide corridor centered on the railroad bed that is shown on the USGS Benson and McGrew Spring 7.5-minute topographic maps southwest of Benson, beginning at the northern boundary of Section 29, T17S, R20E, and running south-southeastward to the eastern boundary of Section 15, T18S, R20E, G&SRB&M, Cochise County, Arizona (Figure 1.1). The corridor passes through the NW¼, NE¼, and SE¼ of Section 29, the SW¼ of Section 28, and the NW¼, NE¼, and SE¼ of Section 33, T17S, R20E; and through the NE¼ of Section 4, the NW¼ and SW¼ of Section 3, the NW¼, SW¼, and SE¼ of Section 10, and the NE¼ of Section 15, T18S, R20E. Of this total project area, only the segment within Section 28 is State-owned land.

The project area is located on the heavily dissected middle bajada of the Whetstone Mountains (Figure 1.1) within the Basin and Range physiographic province. Average elevation is 4,050 feet (1,234 m). Soils in the project area are old alluviums derived from granitic, volcanic, and sedimentary rocks, classified as part of the White House-Bernardino-Hathaway Association (Hendricks 1985:97 and Plate I).

Project area vegetation is typical of the Semidesert Grassland subdivision of the Grassland biotic province (Brown 1982). It includes mesquite, juniper, several species of acacia, desert willow, oak, cholla and barrel cactuses, and native and introduced grasses.

CULTURAL SETTING: SUMMARY OF CULTURE HISTORY

Previous archaeological investigations in the region surrounding the project area indicate that people have occupied southern Arizona for at least 11,000 years (Figure 1.2). Four major prehistoric archaeological cultures -- Paleoindian, Archaic, Hohokam, and Mogollon -- are recognized, as discussed by Jones (2000a) and more thoroughly by Whittlesey et al. (1994). However, no prehistoric cultural materials were identified during this EP&SW recording project, so this summary of culture history focuses on the Historic period.

Spanish Colonial Period (1691-1821)

During their first exploratory expeditions into this region in the 1690s, Spanish military men and clergy found people who spoke the Piman language living in numerous villages of up to a hundred or more people. Many of these villages were at or near sites still occupied today (Bolton 1936).

The introduction of Europeans and Christianity changed the native ways of life profoundly. Livestock, wheat, and other domesticates were added to an economy that had been focused on the production of corn, beans, squash, cotton, and agave for more than 2,000 years previously. Diseases introduced by Europeans wiped out entire Indian communities. The remaining native settlements of Sonora and Arizona were reorganized with a new focus on Catholic mission communities. *Presidios*, or fortified towns, were established by the Spanish at strategic places, originally for protection against Apaches, but these outposts were also occasionally utilized to keep the usually friendly Pimans in check.

Mexican Period (1821-1854)

The missionization and military protection programs of the Spanish colonial government engendered an influx of Spanish colonists early in the eighteenth century that eventually brought an end to the strung-out pattern of Indian villages along the length of the San Pedro and Santa Cruz rivers. These river valleys came to be dominated by inhabitants of Spanish and Mexican descent who survived mainly by farming, ranching, and trade. Apaches began raiding extensively in southern Arizona after 1830 and were a major threat to the Mexican settlements. By the time of the Gadsden Purchase by the United States in 1854, Spanish and later Mexican settlements were well established, and ranching and mining had replaced much of the traditional agricultural subsistence base.

The Gadsden Purchase (1854) and the Territorial Period (1863-1912)

The Mexican War of 1846 and the subsequent transfer of the Gadsden purchase to U.S. ownership in 1854 were primary historical events leading to the end of Spanish and Mexican dominance in the southern Arizona. Arizona officially became a U.S. territory in 1863, during the War between the States. Ranching and mining dominated the Territorial economy and brought in transient Anglo-Americans in search of gold, silver, and other minerals. The war with the Apaches ended, and the coming of the railroad to Tucson in 1880 brought with it a more commercially oriented economy dominated by Anglos. The San Xavier Indian Reservation was established south of Tucson for the Papago (Tohono O'odham) Indians in 1874, after Piman-speaking Indians had abandoned the San Pedro Valley because they could not cope with European diseases and Apache raiding.

Statehood (1912 and Later)

Since Arizona became a state in 1912, government-sponsored programs of the United States and Arizona have brought improvements in transportation, education, and agriculture. The U.S. Military base at Fort Huachuca and land development have become major economic forces in the San Pedro River Valley but farming and ranching have remained important.

The El Paso and Southwestern Rail Road

The El Paso and Southwestern Rail Road (EP&SW) began as the Arizona and Southeastern Rail Road (A&SE), incorporated on May 24, 1888, by the Copper Queen mine to haul copper bullion from their mine in Bisbee to the New Mexico and Arizona Rail Road (NM&A) at Fairbank. After a dispute concerning the NM&A railroad's freight rates, the A&SE was extended to Benson, paralleling the NM&A railroad on east side of San Pedro River.

In 1900 the A&SE was extended to a new smelter being build approximately 26 miles east of Bisbee near what today is the Town of Douglas, and to Naco on the Mexican border where it connected to a Mexican railroad to bring ore from the Cananea mining district. Also in 1900 the Copper Queen incorporated a new railroad company, the Southwestern Railroad of Arizona (SRA), and began construction of a line to haul bullion from the Douglas smelter to Deming, New Mexico. The Arizona portion of the SRA railroad was changed to the El Paso and Southwestern Rail Road on June 25, 1901. At the same time the New Mexico portion was also renamed, becoming the Southwestern Railroad of New Mexico at this time. The EP&SW bought the Southwestern Railroad of New Mexico June 17, 1902 and extended the line to El Paso, Texas, finishing in December 1902.

In the early 1900s the EP&SW constructed numerous short rail lines to mines in the Bisbee region and bought the El Paso and Northeast Rail Road, extending its service as far east as Tucumcari, New Mexico. In 1911 and 1912 the line was extended from Fairbank to Tucson along the west side of the San Pedro River. The EP&SW bed within the Whetstone Ranch and State Trust land investigated during this project is a portion of this "Tucson Extension."

The EP&SW was sold to the Southern Pacific Rail Road on November 1, 1924, and the portion of the Tucson Extension between Mescal and Fairbank was abandoned on December 20, 1961 (Myrick 1975:227, 245-249).

AZ AA:12:875 (ASM), El Paso Natural Gas Company Pipeline No. 1007

Besides the EP&SW segment, another prominent historical cultural resource traversing the Whetstone Ranch is the El Paso National Gas Company's Pipeline No. 1007 (Figure 1.1). The pipeline has been designated AZ AA:12:875 (ASM) by the Arizona State Museum, an alphanumeric listing that reflects the fact that the first segment of it that was recorded by the ASM is in the Marana area.

The history of the pipeline actually begins during the Great Depression of the 1930s when natural gas usage in El Paso, Texas, dropped to the point that the utility that supplied gas to the town, the El Paso Gas Utilities Corporation, was forced to either sell out or expand into larger markets. The closest markets were the copper mining towns of Douglas and Bisbee, Arizona, and Cananea, Mexico, over 500 miles away. The utility's founders, Paul Kayser and H. G. Frost, entered into a contract to deliver gas to the Phelps Dodge Corporation mines in Arizona, and other mining companies quickly saw the savings in energy costs and joined in. Construction on the pipeline to Douglas and Bisbee was completed in June 1931 by the El Paso Natural Gas Company (EPNG), a company founded by Kayser and Frost to construct and maintain natural gas pipelines. Service was also extended to Cananea, Mexico, through a subsidiary, Compania Occidental de Gas, S.A. (Mangan 1977).

The new 12-inch pipeline from El Paso to Douglas, in southeastern Arizona, was the longest in existence at the time, and was designed to operate at pressures far higher than those ever used to transmit gas. New construction techniques, including the use of mechanical trenchers in place of pick-and-shovel hand laborers, were employed. Compressor stations were built between the original supply point in Jal, New Mexico, and El Paso, and between El Paso and Douglas, to maintain line pressure (Mangan 1977).

As the Depression worsened, the country's demand for copper weakened and copper companies cut production to twenty percent of capacity. Faced again with declining profits and unused line capacity, EPNG proposed to extend natural gas service to the growing markets of Tucson and Phoenix. The company applied for and obtained an R.F.C. (Reconstruction Finance Corporation) loan from the U. S. government and construction on EPNG Pipeline No. 1007 began in late summer of 1933. Because of the R.F.C. loan, pick-and-shovel labor was used to open the pipeline trench. Laborers were recruited from each county as construction progressed, providing much-needed jobs to unemployed men, and an influx of money into the communities they lived in. Pipeline No. 1007 reached Tucson on December 11, 1933, and Phoenix on January 11, 1934 (Mangan 1977).

PREVIOUS ARCHAEOLOGICAL RESEARCH IN THE PROJECT VICINITY

A review of the records of the Arizona State Museum (ASM), University of Arizona, revealed that a section of the El Paso and Southwestern Rail Road bed was first recorded at the ASM as AZ EE:3:40 (ASM) in association with the historical Whetstone section house of the railroad. This designation was retained for a segment of the road bed crossing a portion of the Whetstone Ranch surveyed by Old Pueblo during July and August 2000 (Jones 2000a). However, after that report was issued, Sharon Urban of the Arizona State Museum site files office inspected the ASM's maps of the entire AZ EE:3 quadrangle and found that at least five different alphanumeric designations had been assigned by the ASM to various segments of the

abandoned railroad bed. Urban then decided to retain the AZ EE:3:40 (ASM) designation for the Whetstone section house only, and to designate the entire abandoned Mescal-to-Charleston portion of the El Paso and Southwestern Rail Road bed and right of way (all of which is within the EE:3 quadrangle) as site AZ EE:3:43 (ASM), the second earliest site number that had been assigned to any other segment of the railroad bed. Other site number designations for the bed were then voided but were retained in the ASM site files with the records for AZ EE:3:43 (ASM) rather than reused because those other numbers appear in published reports.

The ASM records review also showed that the historical El Paso Natural Gas Pipeline No. 1007 crosses the southern end of the inspected railroad bed segment. Pipeline No. 1007 was originally recorded for the ASM in the AZ AA:12 quadrangle (i.e., in the vicinity of Marana, Arizona) and given the designation AZ AA:12:875 (ASM). This designation will be retained for the entire length of the pipeline regardless of which ASM site quadrangle it crosses (Sharon Urban, personal communication to Jeffrey Jones, November 8, 2000).

Two prehistoric agricultural dryfarming sites ascribed to the prehistoric Hohokam culture, AZ EE:3:48 (ASM) and AZ EE:3:68 (ASM), are also recorded within a 1-mile radius of the railroad project area (Jones 2000a, 2000d).

INVESTIGATION METHODS

Fieldwork for the EP&SW cultural resources study project was conducted on January 22, 25, and 26, 2001, by archaeologist Jeffrey Jones (project director), assisted by archaeology technician Michael Cook. A total of 4.375 person-days were expended on the field effort.

To begin fieldwork on the subject segment of the El Paso and Southwestern Rail Road (EP&SW) bed and right of way, all archaeological features associated with the road bed were assigned cultural feature numbers, described in notes, and photographed using color slide and black-and-white print film. One of each type of feature was also drawn to scale.

Photographs of the roadbed were taken locations chosen to provide a good overall view of the roadbed itself, and the terrain across which it was constructed.

Three features, possible camp Feature 3, artifact scatter Feature 27, and loading dock Feature 37, contained concentrations of artifacts. At these three features a representative sample of culturally, functionally, or temporally diagnostic artifacts was collected and an inventory of the artifacts noted on the ground surface (but not collected) was compiled by walking 2-m-apart parallel transects across the feature areas and collecting or recording all artifacts seen. As noted in earlier reports about cultural resources surveys in the vicinity of the project area (Jones 2000a, 2000b, 2000c, 2000d) artifacts are almost nonexistent in portions of the project area outside these three concentrations but were collected or inventoried if encountered while mapping and photographing features.

No artifacts were collected from the portion of the project corridor on State Trust land in Section 28, or from the portion that is proposed to include a segment of a transmission line in Section 29.

El Paso Natural Gas pipeline No. 1007 crosses the railroad right of way near the south end of the study area. The pipeline inspection and maintenance road and all features associated with the portion of the gas line within the railroad right of way were also photographed.

Maps were compiled using computer-aided drafting equipment and a combination of a total station theodolite and a global positioning system (GPS) satellite receiver. The theodolite was set up at Geodetic reference station "Juan" located east of the railroad right of way and south of the El Paso Natural Gas pipeline. A graded area with associated artifacts that likely represents a construction or maintenance camp, the natural gas line, a temporary siding and associated earthen loading dock, the east and west right of way fences, and two culverts were mapped with the theodolite from this location. The remaining features were mapped using the GPS receiver. All mapping for Old Pueblo's project was done by Austin Lenhart of Archaeological Consulting and Mapping Services, Inc. (ACMS) assisted by Old Pueblo's Jeffrey T. Jones.

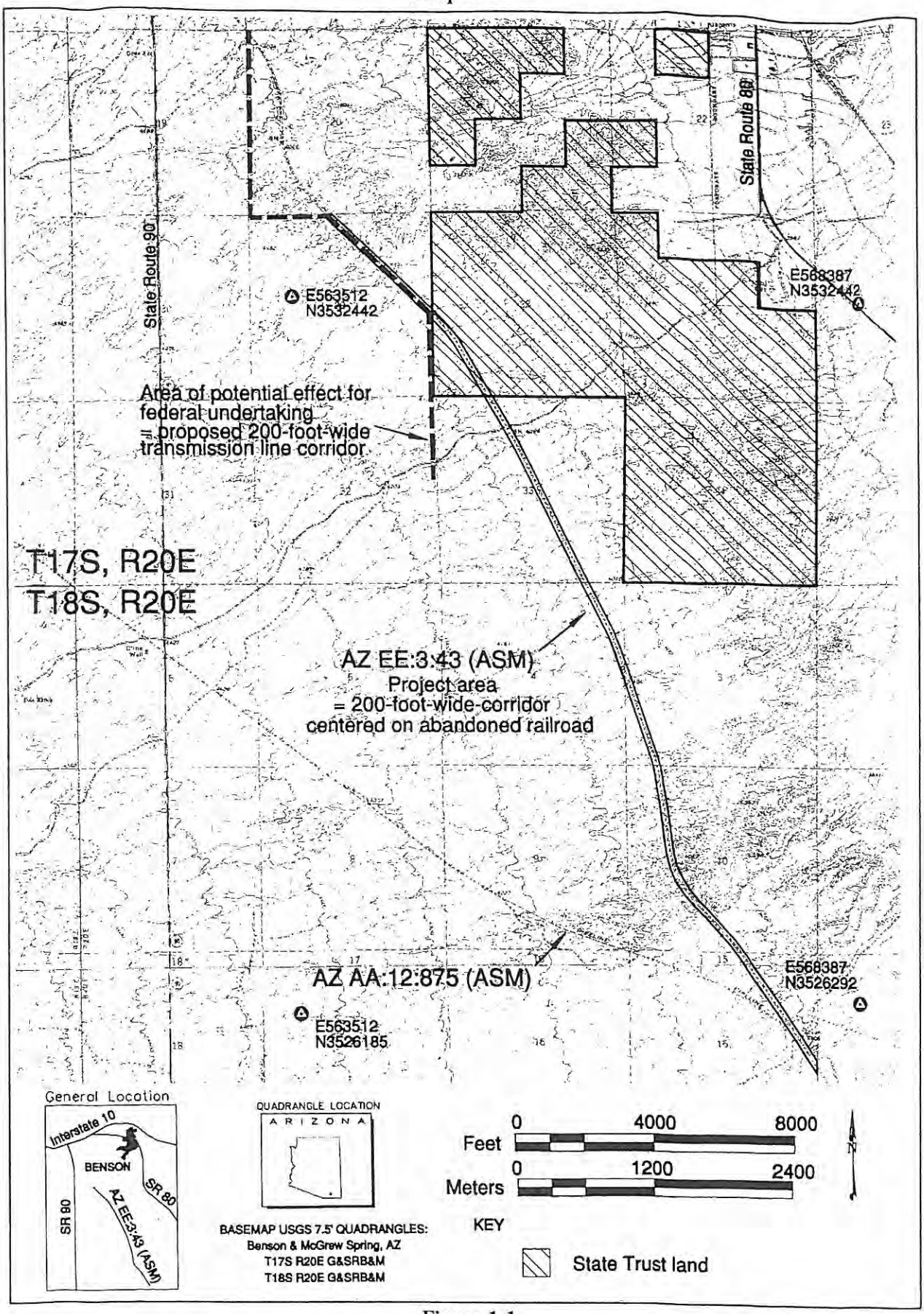


Figure 1.1

Reduced-scale copy of portions of the USGS Benson (1973, PR1983) and McGrew Spring (1983), Arizona, 7.5-minute topographic maps showing project area and sites AZ EE:3:48 (ASM) and AZ AA:12:875 (ASM)
State Trust land is indicated by hachuring (information from 1990 Arizona State Land Department's Cochise County surface ownership map). Universal Transverse Mercator (UTM) coordinates, all in Zone 12, included for spatial reference only.

Year	Cultural tradition		Periods	Culture phases for individual geographic areas: Tucson Basin & Avra Valley	Phoenix Basin	Tohono O'odham Reservation/Papagueria
	RECENT (MIXED)		HISTORIC PERIOD	Tohono O'odham, Apachean,	O'odham, Yuman, Apachean, & Euro-American	O'odham, Apachean, & Euro-American
1700						
1600	O'ODHAM (PIMAN), APACHEAN, & YUMAN	POTTERY MAKING TIMES	PROTOHISTORIC PERIOD	Tohono O'odham (Papago) & Sobaipuri O'odham — Apachean	Akimel O'odham (Pima) & Tohono O'odham (Papago) — Yuman, Apachean	Tohono O'odham (Papago) — Apachean
1500						
1400	HOHOKAM		CLASSIC PERIOD	Tucson phase	Polverón phase	
1300					Civano phase	Sells phase
1200				Tanque Verde phase	Soho phase	Topawa phase
1100			SEDENTARY PERIOD	Rincon phase: Late Rincon / Middle Rincon / Early Rincon	Sacaton phase	Vamori phase
1000						
900			COLONIAL PERIOD	Rillito phase	Santa Cruz phase	
800				Cañada del Oro phase	Gila Butte phase	Gila Butte phase
700			PIONEER PERIOD	Snaketown phase; Sweetwater phase; Estrella phase	Snaketown phase; Sweetwater phase; Estrella phase	[Unnamed]
600			EARLY CERAMIC PERIOD	Tortolita phase	Vahki phase	
500						
400	[Unnamed]			Agua Caliente phase	Red Mountain phase	
300						
200						
100			LATE ARCHAIC-EARLY AGRICULTURAL PERIOD	Cienega phase		
A.D. / B.C.		PRECERAMIC TIMES				
1200	ARCHAIC			San Pedro stage		
			MIDDLE ARCHAIC PERIOD			
			EARLY ARCHAIC PERIOD			
	PALEO-INDIAN		PALEOINDIAN PERIOD			
			PRE-PROJECTILE POINT HORIZON?			

Figure 1.2
Comparative cultural sequences for south-central Arizona. Note different scale for B.C. dates.

Chapter 2

Cultural Features

Jeffrey T. Jones

The purpose of this study was to document visible cultural features associated with the portions of the El Paso and Southwestern Rail Road and the El Paso Natural Gas Pipeline No. 1007 that are within the inspected area, in accordance with the *State Historic Preservation Act Documentation Standards for Historic Properties, revised April 1987.* To this end all discovered archaeological features were assigned a cultural feature number, and recorded as described in Chapter 1.

This chapter describes all of the features that were recorded.

EL PASO AND SOUTHWESTERN RAIL ROAD FEATURES ON STATE AND PRIVATE LAND

Mapped and photographed cultural features on the Whetstone Ranch portion of the EP&SW railroad include 27 concrete culverts, 5 signal flag foundations, 1 possible sign or light pedestal, 1 bridge, 1 possible camp site, 1 hole-in-top can concentration, 1 asphalt diversion dam, and 1 earthen unloading ramp with an associated temporary siding (Figures 2.1-2.6). Feature descriptions are separated into two sections, those on state-owned land, and those on private land. Summaries of all cultural features recorded are presented in Tables 2.1 and 2.2.

RAILROAD FEATURES ON STATE TRUST LAND (SECTION 28, T17S, R20E)

Three cultural features – an arched culvert, a signal flag foundation, and a bridge (Features 28, 29, and 30, respectively) -- were mapped and photographed on State-owned land in Section 28 (Table 2.1).

The culvert (Feature 28) consists of a poured-concrete arch over a flat concrete base (Figure 2.7). The culvert passage is 18 ft wide and more than 8 ft high with 18-inch-thick abutments that protrude outward at 45-degree angles from either end, helping to direct floodwater into the culvert. A concrete and cross-tie apron extends 35 ft northward from the northern abutment. This culvert is of the same type as the arched culverts identified on private land, discussed below.

The signal foundation (Feature 29) is a rectangular, poured concrete box that originally was partially buried along the railroad bed (Figure 2.8). The box was prefabricated and brought to the railroad bed already finished. It consists of two parts, a flat concrete base and a concrete box with an open bottom that was set down on the base. The upper surface of the box has a rectangular entry port, apparently to provide access to electrical equipment or controls located inside the box, and four mounting bolts where the signal flag pole was bolted to the top. The signal flag pole has been removed and the signal flag box has been bulldozed from its original position.

The concrete bridge (Feature 30) consists of a 60-foot long by 16-foot wide poured concrete bed resting on six concrete pylons (Figures 2.9, 2.10). Concrete aprons extends over 55 ft northward and 30 ft southward from the bridge. The bridge spans one of the larger washes in the project area.

No artifact concentrations were located near any of these features and no artifacts were collected from within the State-owned portion of the railroad bed.

RAILROAD FEATURES ON PRIVATELY OWNED LAND

Mapped and photographed features on privately owned land along the EP&SW bed and right of way consisted of 26 concrete culverts, 4 signal flag foundations, 1 possible camp site, 1 hole-in-top can concentration, 1 asphalt diversion dam, and 1 earthen unloading ramp with an associated temporary siding (Table 2.2). The ramp and siding are probably associated with the construction of El Paso Natural Gas Pipeline No. 1007, which crosses the EP&SW adjacent to the ramp. The east and west right of way fences and a series of stumps where telegraph or electric power poles were cut off at ground level were also mapped.

Two basic styles of concrete culverts -- arched culverts (Figures 2.11-214) and box culverts (Figure 2.15) -- were present along the investigated portion of the road bed on the privately owned land. The more common style is the arched culvert, which includes a poured-concrete arch over a flat concrete base. Although culverts of this style vary in width from 2 ft to 18 ft, their construction is almost identical, the only difference being that the small arched culverts (those that are between 2 ft and 4 ft wide) have straight abutments (Figures 2.12, 2.13) whereas the larger ones have angled abutments that also act as wings to direct water into the culvert. Many of these culverts have concrete extensions added to their abutments, apparently in an effort to curtail undercutting of the original abutments or the road bed by floodwaters.

The arched culverts were used to control deeply incised washes so usually are not visible from the top of the road bed. The length of the culverts vary in relationship to their depth below the railroad grade, with the shallowest culverts measuring 20 feet between openings while the deepest ones are over 120 feet long.

Arched culverts were framed with 4-in, 6-in, and 12-in lumber with the narrower pieces used to form the arch. Seams between the culvert floors and the upper structure indicate the flat floor was poured first and allowed to harden before the upper structure was framed and constructed. No joints are evident between abutments, headers, or the upper portion of the culvert itself, suggesting the entire upper culvert structure was formed in a single pour. Figure 2.14, a photograph of washed-out culvert Feature 21, shows construction methods.

The second style of culvert is the box culvert, which is a rectangular poured concrete structure (Figure 2.15). Box culvert passages measure between 10 and 12 ft wide and are used to channel shallower, wider washes. Four of the rectangular culverts had a single passage and one had three passages. All five culverts of this style have low concrete railings 12 feet apart along each side of the railroad bed.

Like the arched culverts, the box culverts were also framed with 12-inch wide lumber and were probably formed in a single pour. Washed-in sand prevented inspection of box culvert bases but these also were likely poured separately from the upper portions.

The asphalt diversion dam, Feature 12, was made from a mixture of asphalt and small cobbles that apparently was poured across a large wash north of culvert Feature 11. The dam is extremely eroded with only traces of it remaining so its original height is unknown. It serves to direct flood water away from the road bed and southward into culvert Feature 11.

The signal flag foundations on private land are identical to the one mapped and photographed on State-owned land and described above. As with the signal flag box on State-owned land, the flag poles have been removed and the boxes bulldozed from their original positions.

The possible sign or light pedestal, Feature 22, consists of a pyramidal concrete pillar that is 24 inches square at its base, 20 inches high, and has an 18 inch by 20 inch top with 4 ¾-in National Coarse thread bolts in a rectangular pattern extending from it (Figure 2.16). Its actual use is unknown but it appears similar to a concrete base shown holding up a signal light in Myrick (1975:91).

The possible camp site, Feature 3, is a graded flat area with scattered historical artifacts and one concentration of cans along the east side of the railroad bed just north of the El Paso Natural Gas Pipeline. The can concentration is east of the railroad right of way so was photographed but not collected (Figure 2.17).

West of the road bed in the same general area as Feature 3 is a temporary siding, designated Feature 2, and an associated earthen loading dock, Feature 37. The temporary siding exits the main track 1,200 ft south of the loading dock and extends 1,800 feet along the western side of the tracks. It was constructed by bulldozing a level corridor through an area of low, rolling hills adjacent to the main road bed and spreading a moderate amount of slag across the dozed area to support the ties and rails (Figure 2.18). A medium-sized wash was simply filled in with dirt, most of which has now been eroded away.

The loading dock, Feature 37, is an earthen mound that is approximately 12 ft high and 30 ft wide and has a shored, straight edge that fronts temporary siding Feature 2 (Figure 2.19). The flat top of the mound extends westward approximately 36 ft to a concrete cattle guard foundation where the western railroad right of way fence crosses it. The cattle guard foundation is 6 ft wide and 24 ft long with seven 12-inch I-beam impressions 4 ft apart across its western side (Figure 2.20). The cattle guard itself has been removed but probably consisted of railroad rails or some other form of metal welded lengthwise across the I-beams to keep cattle off of the railroad bed. West of the cattle guard is an earthen ramp that slopes down westward approximately 80 ft to the ground surface.

Cut-off power pole stumps on either side of the loading dock average 15 inches in diameter while other power pole stumps along the railroad average only 9 inches in diameter, suggesting that higher poles were used to suspend the power or telegraph lines above the loading ramp area. Because the loading ramp is adjacent to the natural Gas Pipeline, and because there is no road leading to the loading ramp, Feature 37 was likely a temporary installation to unload pipe for the construction of the natural Gas Pipeline.

The hole-in-top can concentration contains several large, commercial-sized hole-in-top cans suggesting it was associated with an organized kitchen operation to feed construction or maintenance workers (Figure 2.21). As the area is heavily dissected and offers little flat ground in which to set up a kitchen, the kitchen was probably operated from a rail car. Because the concentration was east of the railroad right of way and therefore outside the project area, artifacts within the concentration were inventoried but no artifacts were collected from it. However, a representative sample of artifacts was collected from within the railroad right of way in the immediate vicinity. The uneven terrain also suggests that although construction crews may have eaten on the ground in the area, they may have slept in train cars.

EL PASO NATURAL GAS COMPANY PIPELINE NO. 1007 INTERSECTION WITH PORTION OF RAILROAD CORRIDOR ON PRIVATE LAND

The single visible surface feature within the EP&SW right of way that is associated with the El Paso Natural Gas Company pipeline no. 1007 is a 16 ft wide gate through a modern barbed wire fence along the eastern edge of the roadbed (Figure 2.22). The gate is constructed of welded 2-inch diameter pipe and has a hinged fork closure. Conversations with a Post Ranch cowboy who declined to give his name indicate the modern fence was constructed in the 1980s after flooding destroyed fences across washes. No gates or gate posts remain where the gas line crosses the railroad right of way fences.

Two "Caution High Pressure Gas Line" signs reported during Old Pueblo's 2000 survey of the area (Jones 2000c) had been removed before the 2001 recording project began, and flexible plastic warning signs have been placed east and west of the railroad right of way.

According to Mangan (1977), the actual pipeline segment that passes through the EP&SW corridor is a 12-in diameter steel pipe buried 2 to 4 ft deep.

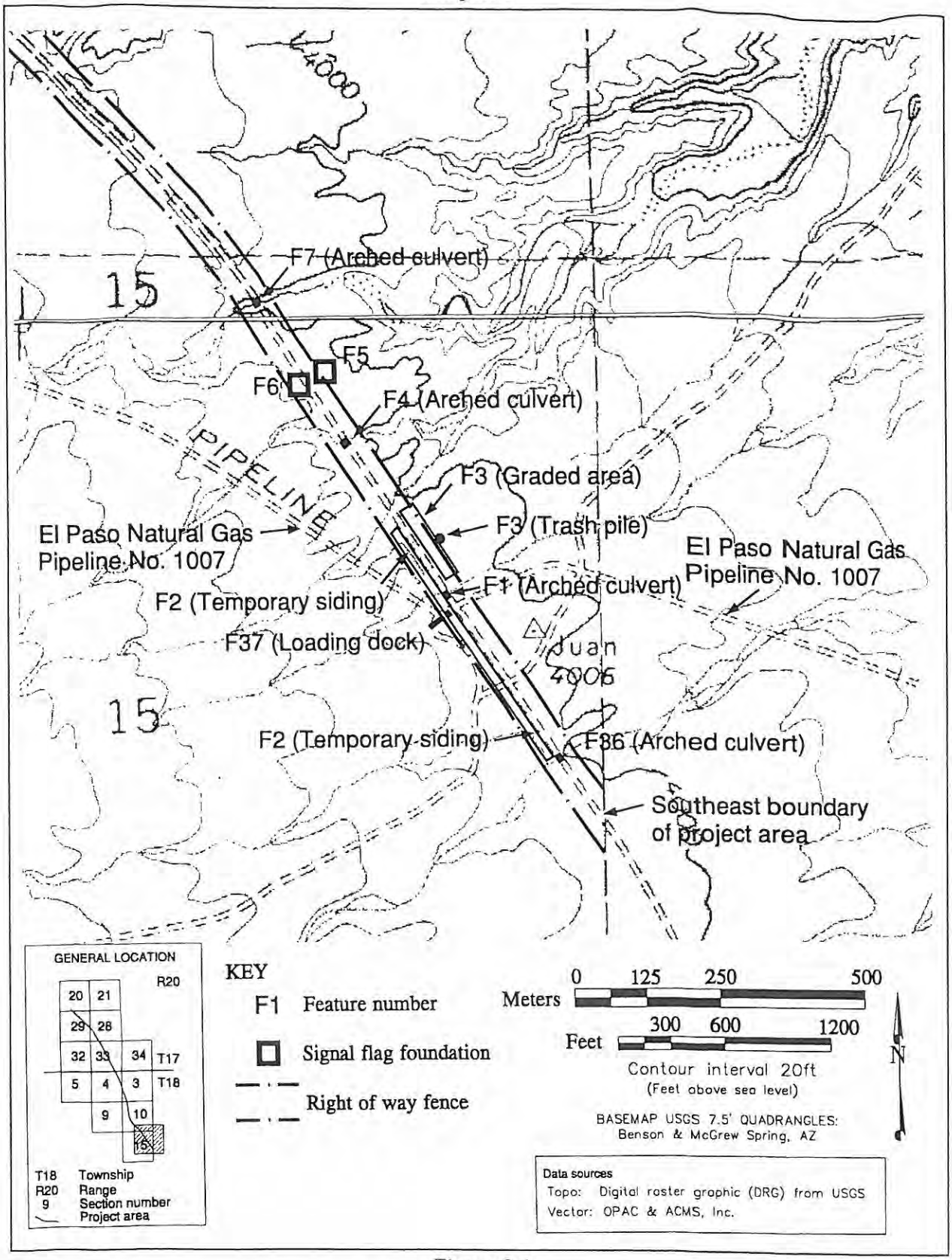


Figure 2.1
Copy of portions of the USGS Benson(1973, PR1983) and McGrew Spring (1983), Arizona 7.5-minute topographic maps showing project area and location of Features 1-7, 36, and 37

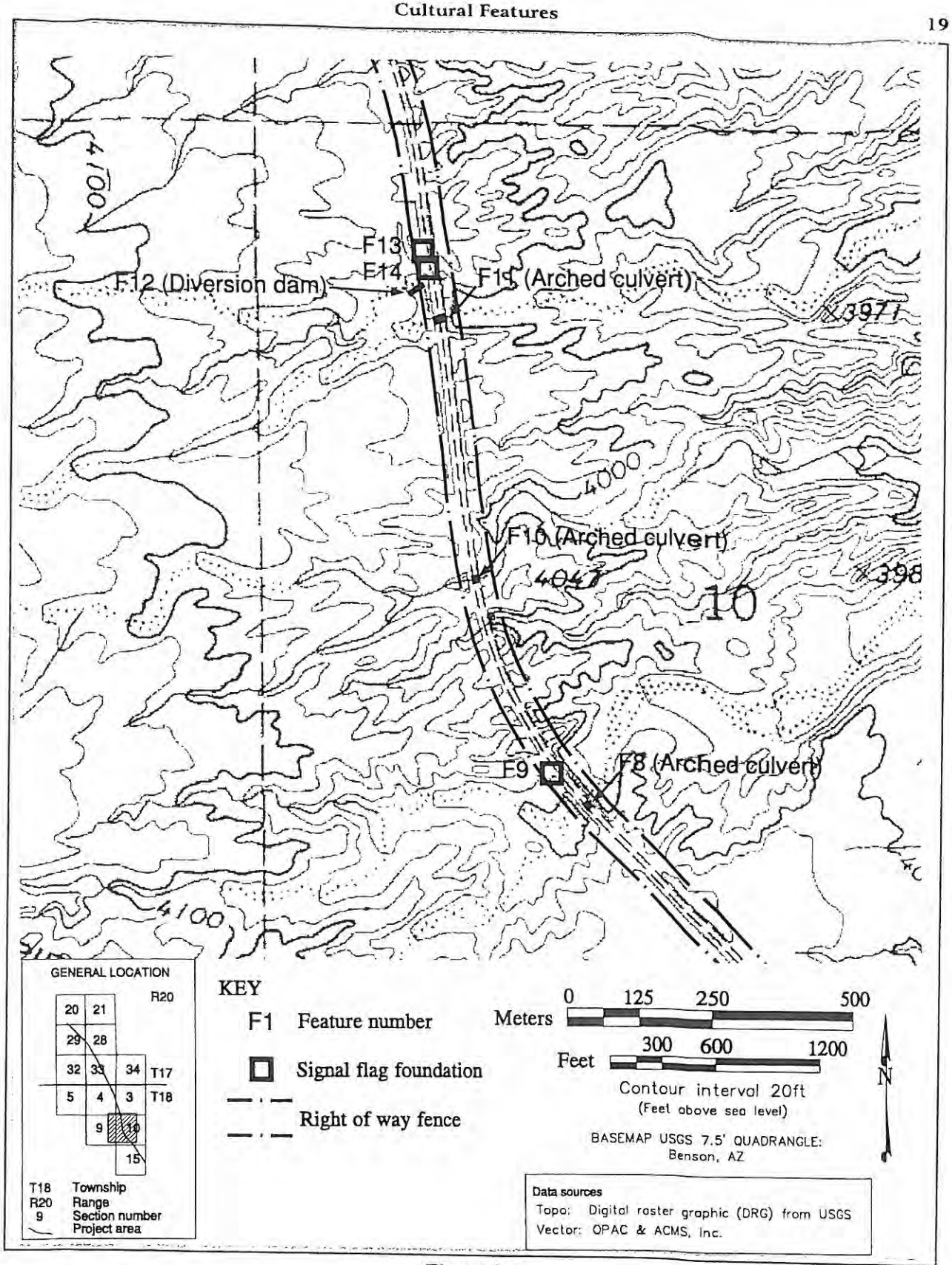


Figure 2.2
Copy of portion of the USGS Benson(1973, PR1983), Arizona, 7.5-minute topographic map showing project area and location of Features 8-14

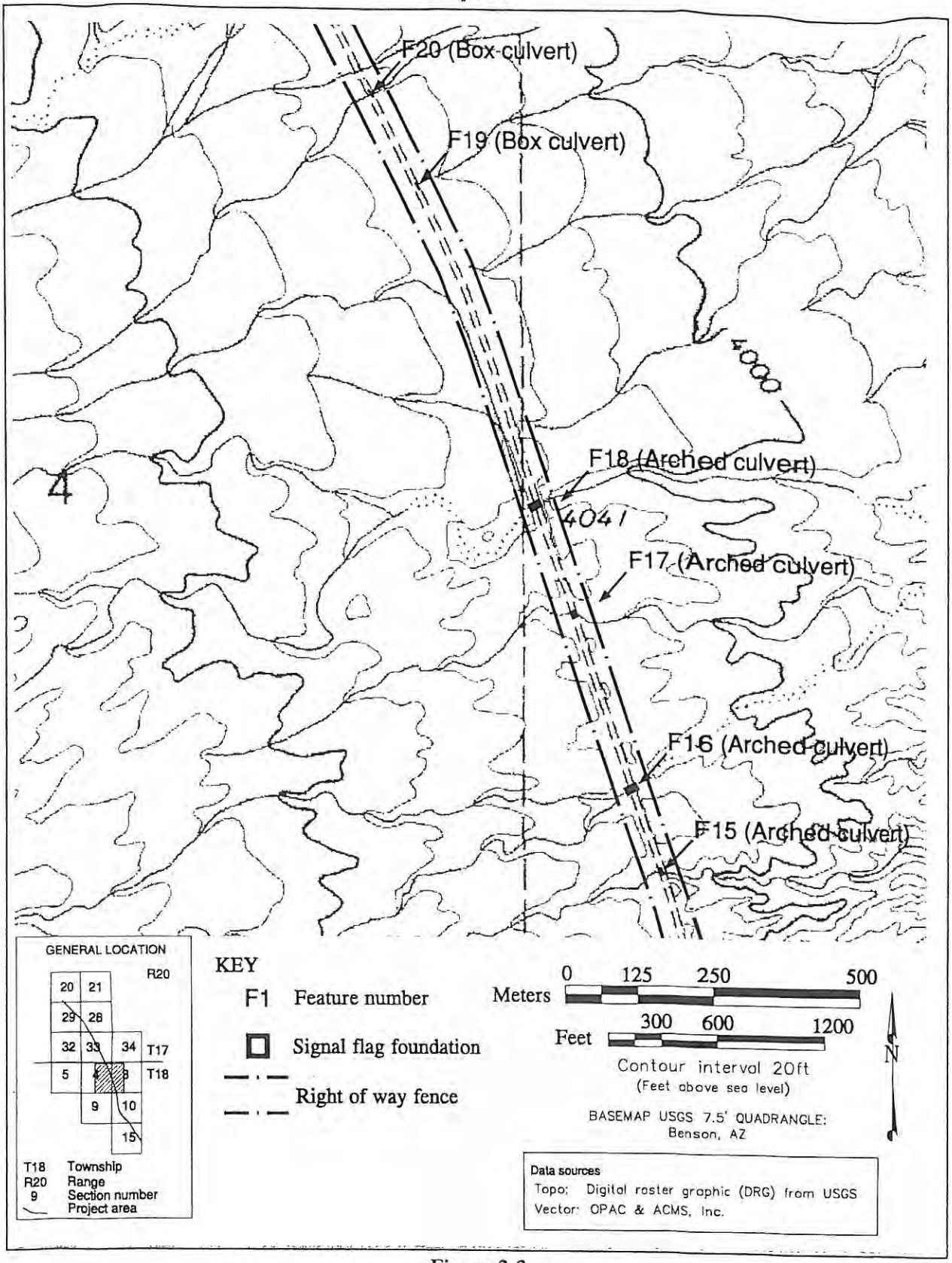


Figure 2.3
Copy of portion of the USGS Benson(1973, PR1983), Arizona, 7.5-minute topographic map showing project area and location of Features 15-20

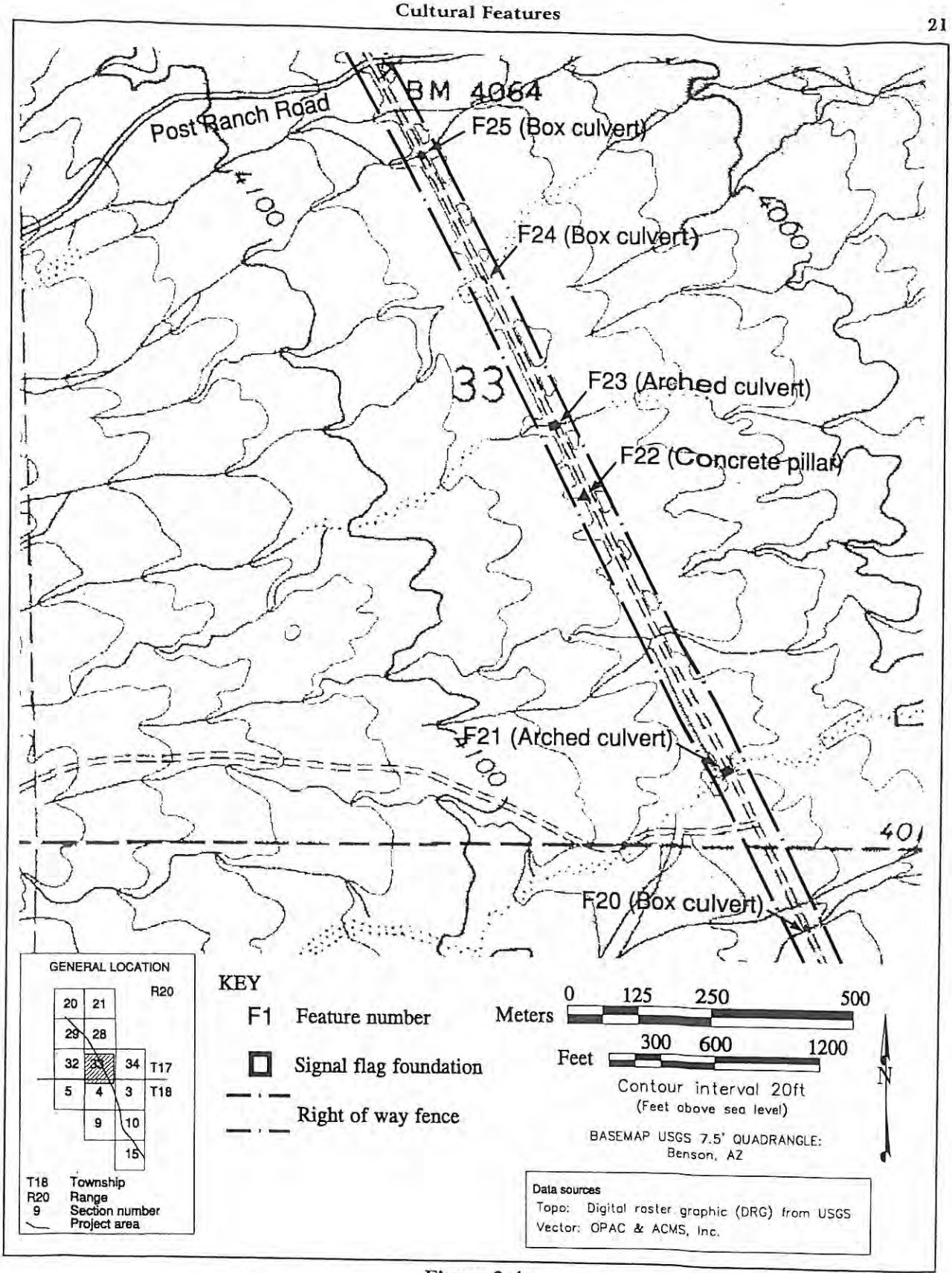


Figure 2.4
Copy of portion of the USGS Benson (1973, PR1983), Arizona
7.5-minute topographic map showing project area and location of Features 20-25

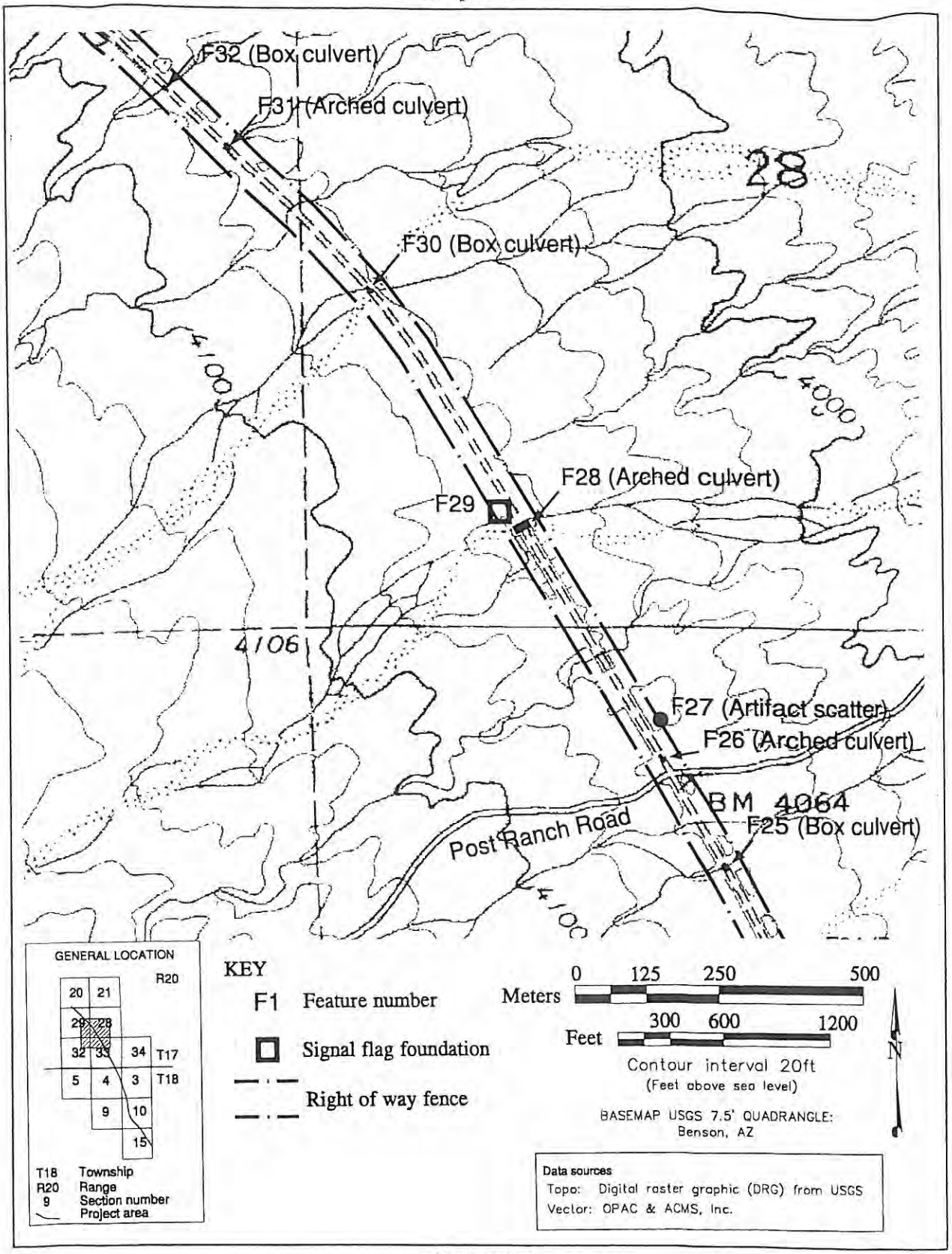


Figure 2.5
Copy of portion of the USGS Benson (1973, PR1983), Arizona
7.5-minute topographic map showing project area and location of Features 25-32
including the only cultural features recorded on State Trust land in Section 28 (Features 28, 29, and 30)

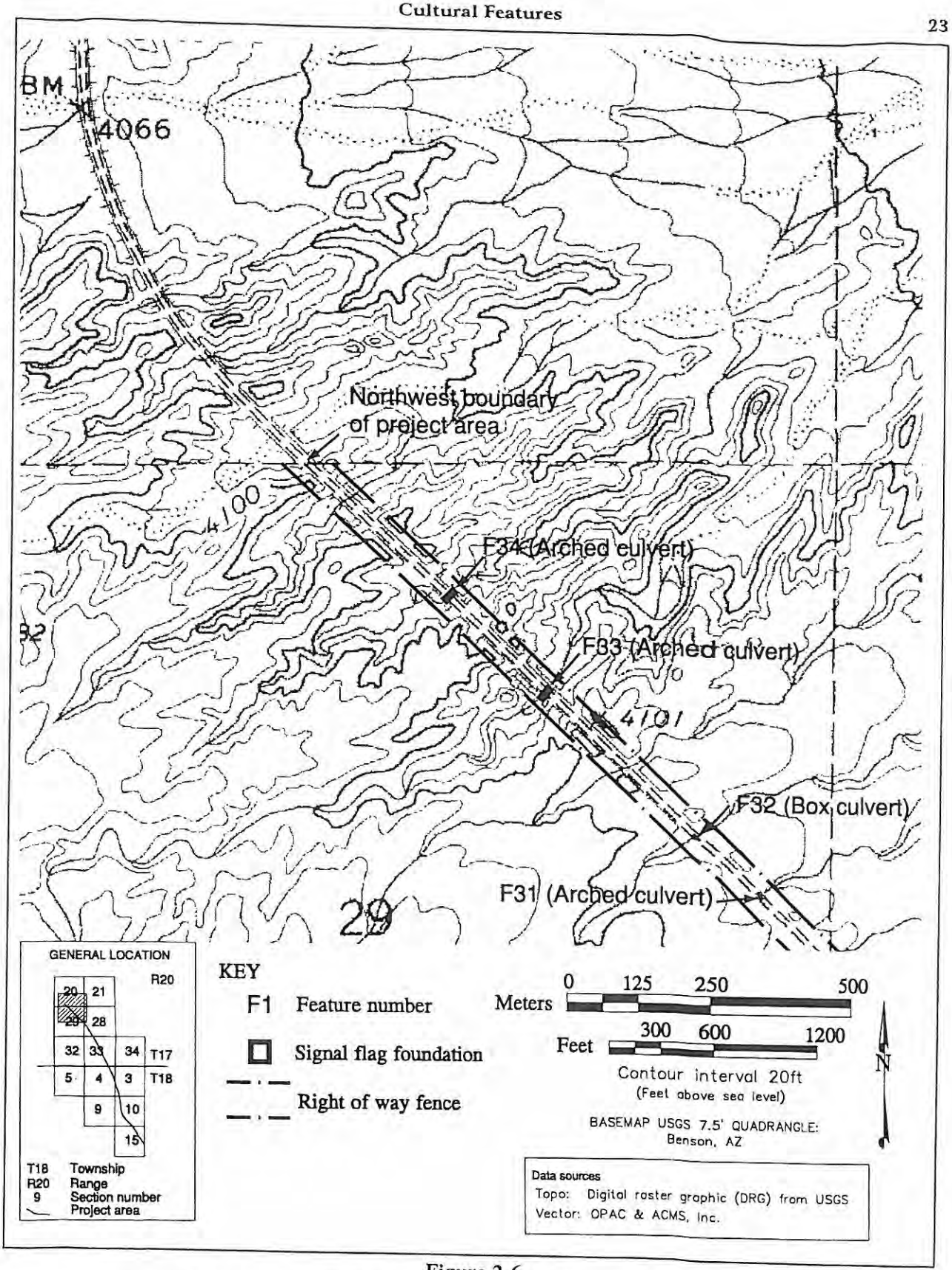


Figure 2.6
Copy of portion of the USGS Benson (1973, PR1983), Arizona
7.5-minute topographic map showing project area and location of Features 31-34

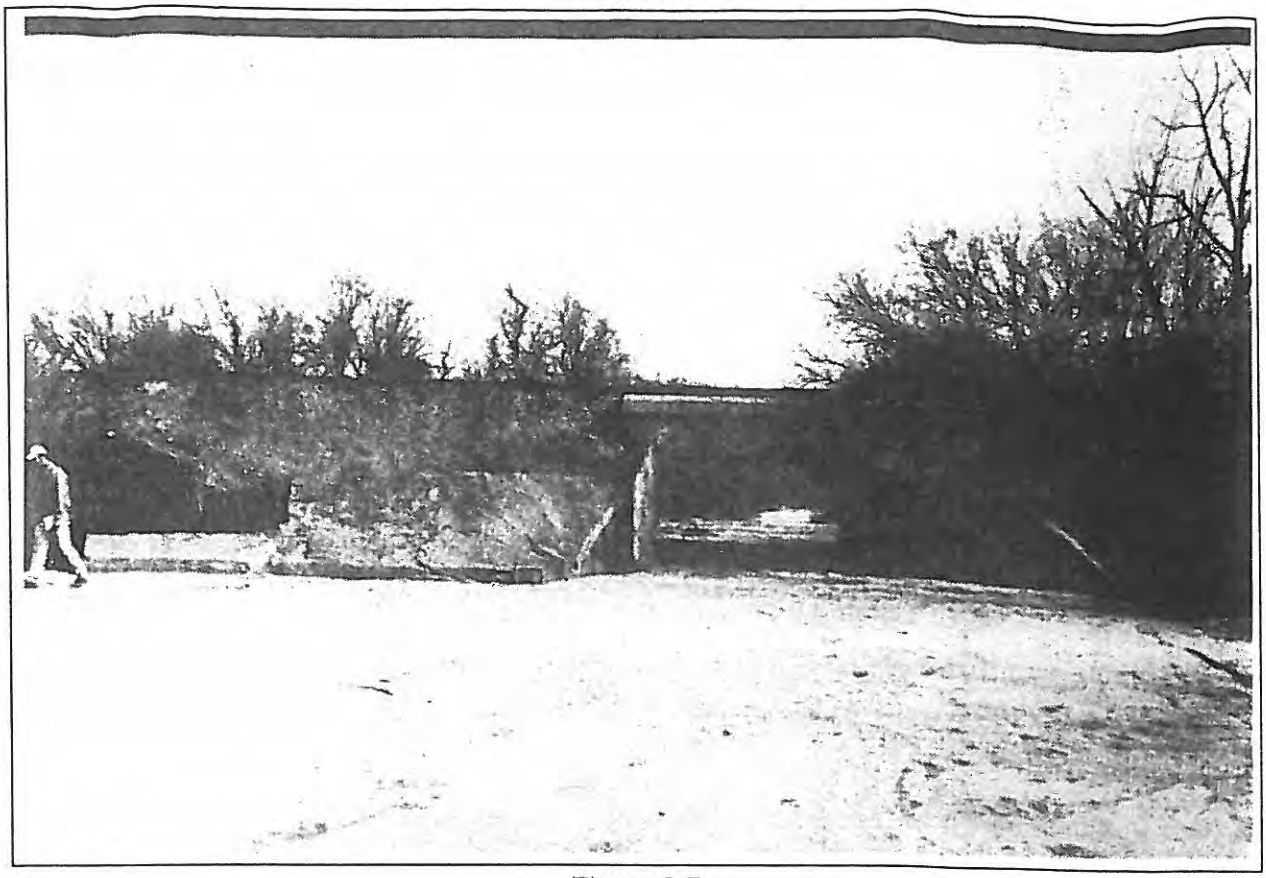


Figure 2.7
Photograph of large arched culvert Feature 28

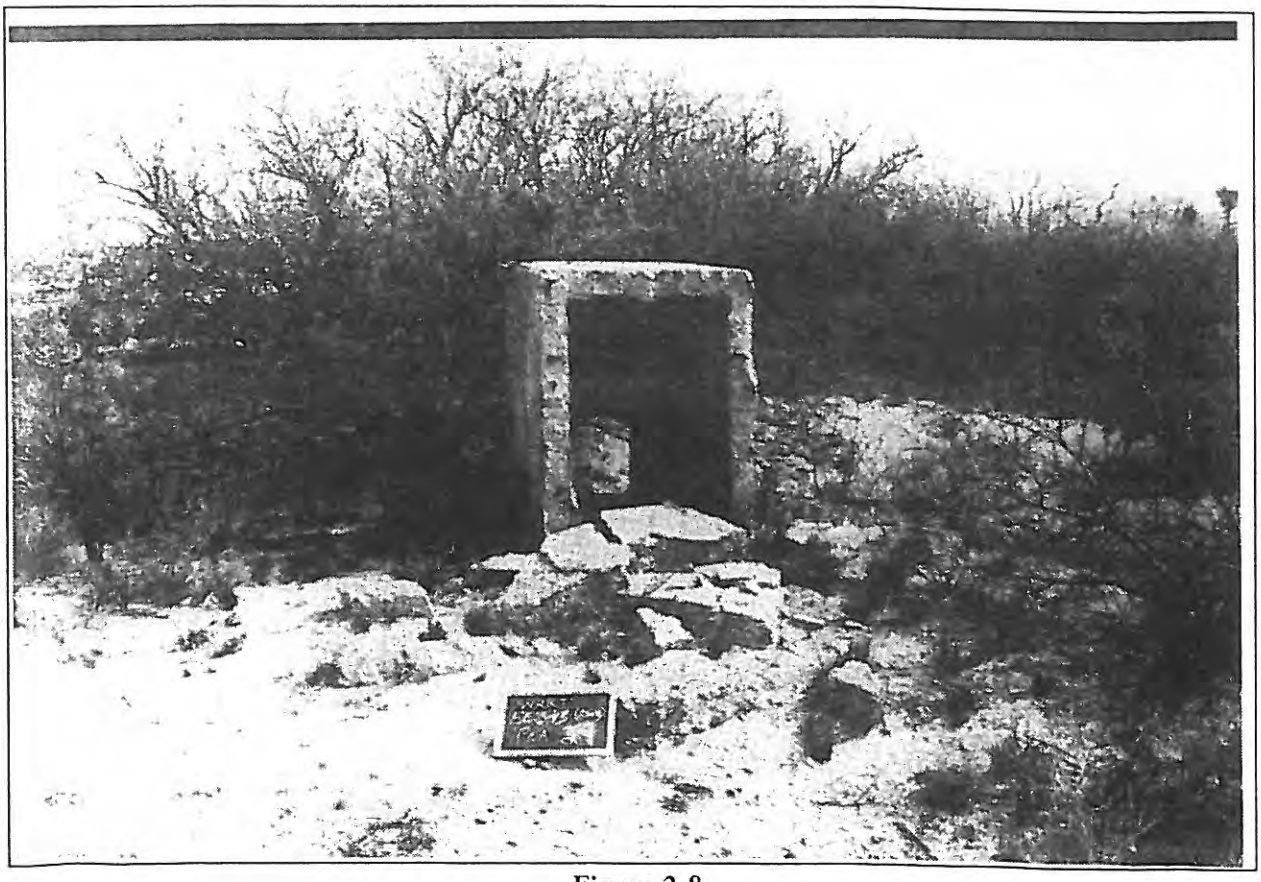


Figure 2.8
Photograph of signal flag foundation Feature 29

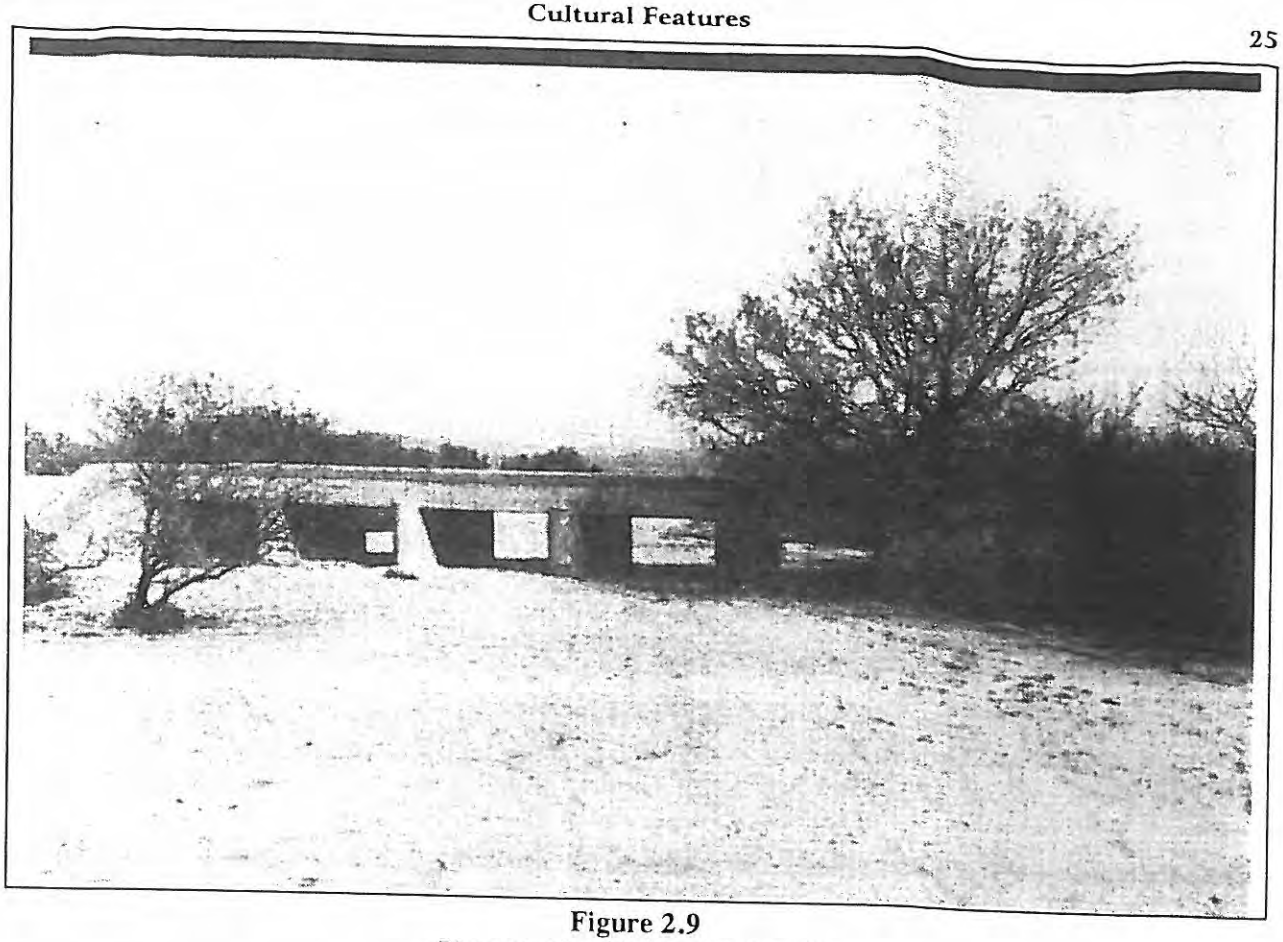


Figure 2.9
Photograph of bridge Feature 30

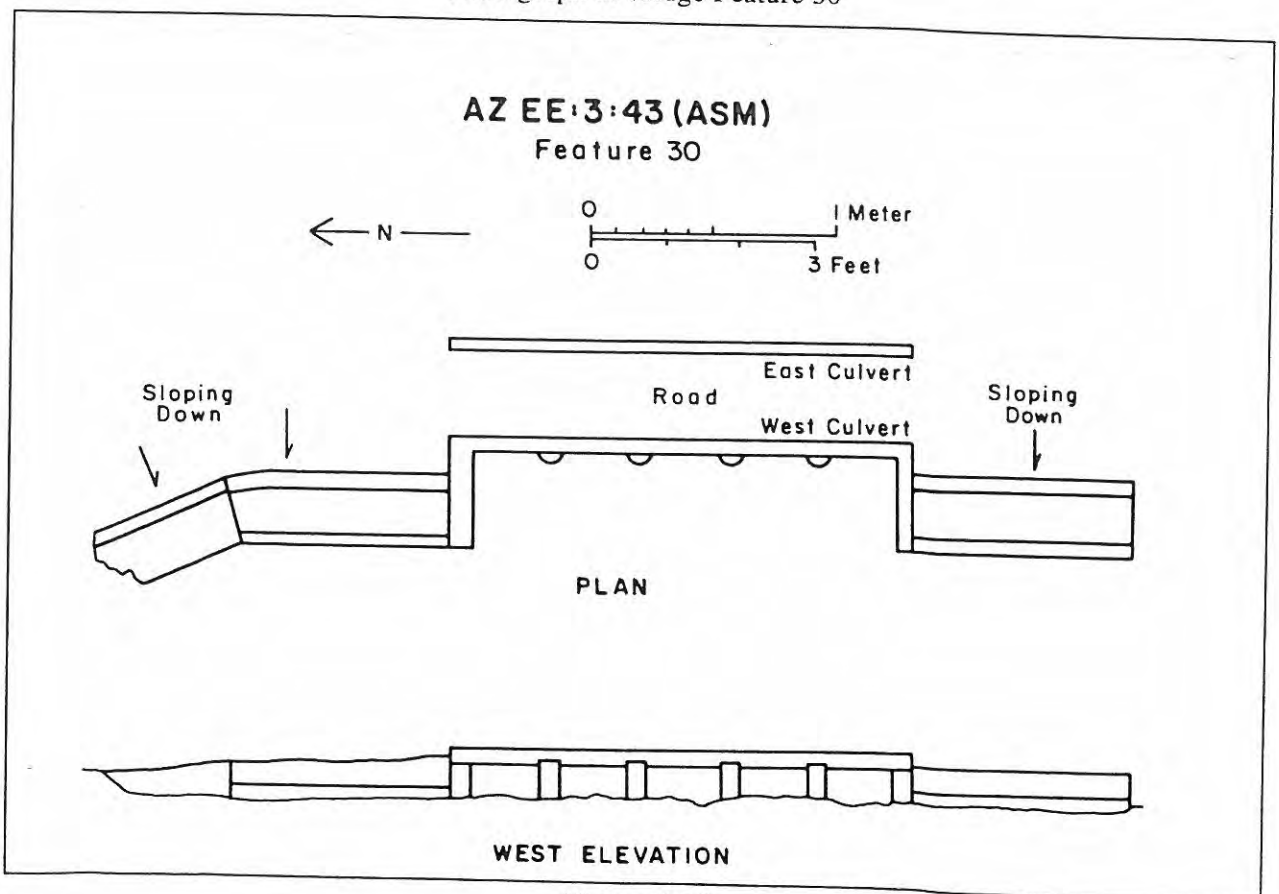


Figure 2.10
Plan and elevation drawing of bridge Feature 30

Figure 2.11
Photograph of small arched culvert with straight abutments, Feature 17

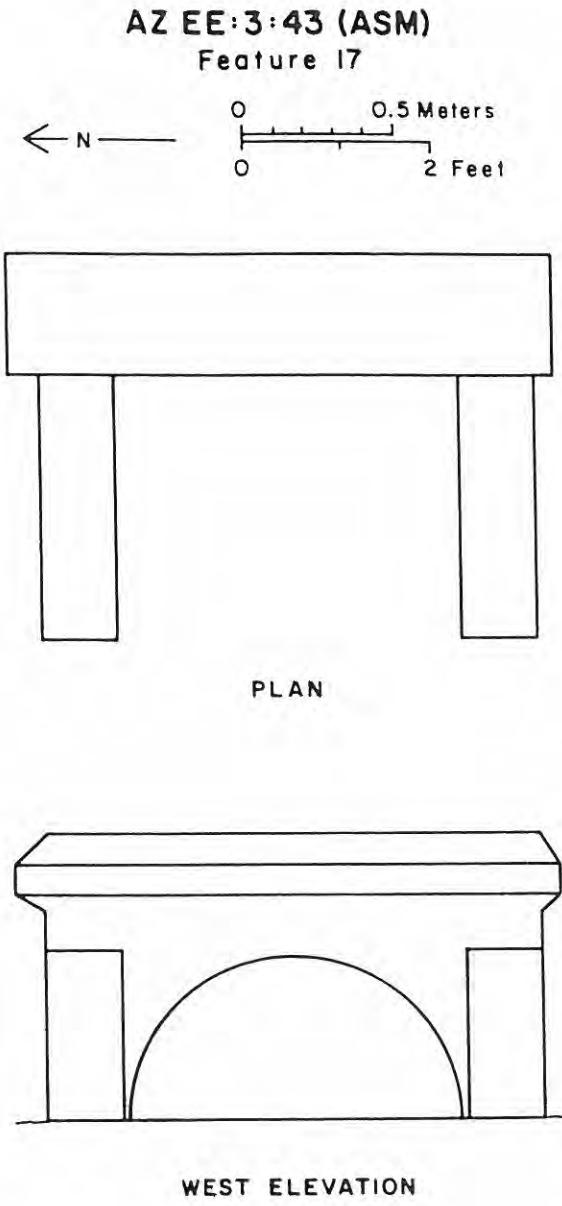


Figure 2.12
Plan and elevation drawing of small arched culvert Feature 17

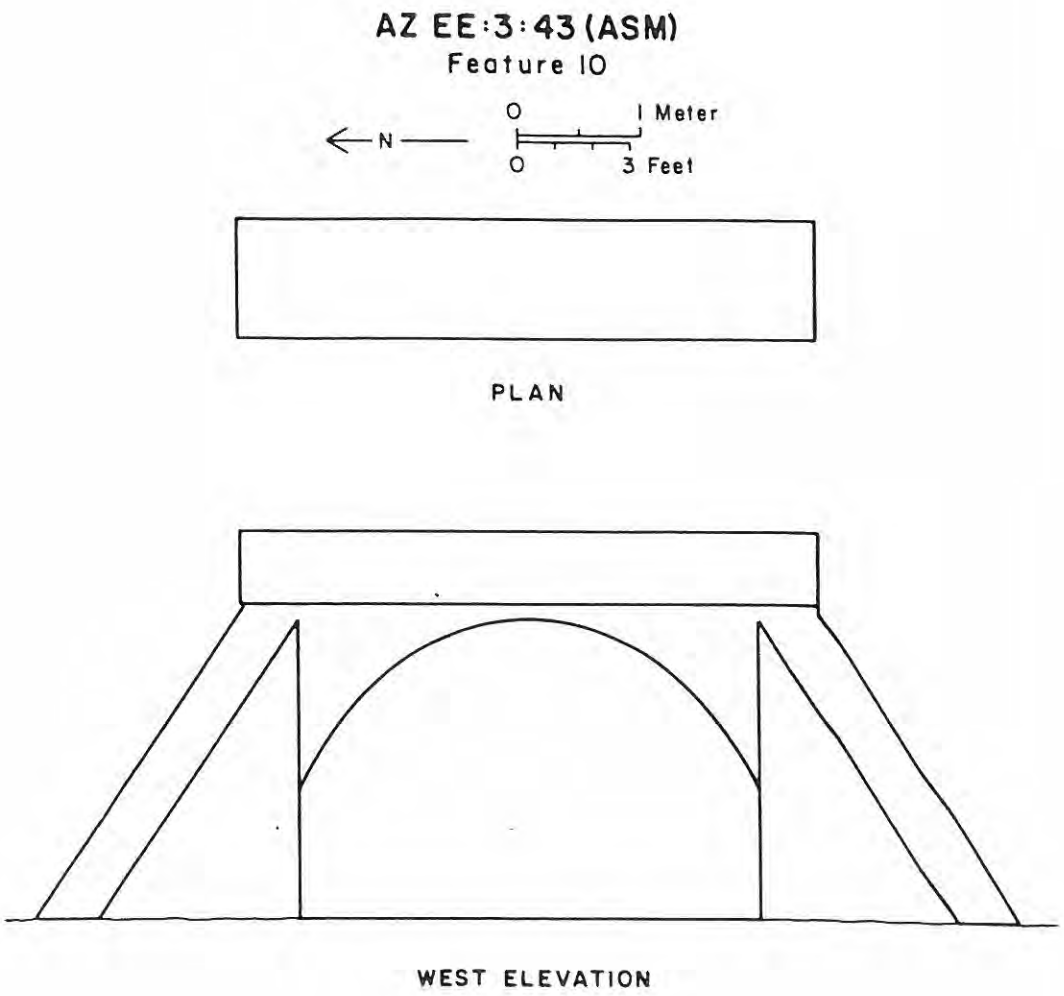


Figure 2.13
Plan and elevation drawing of large arched culvert Feature 10

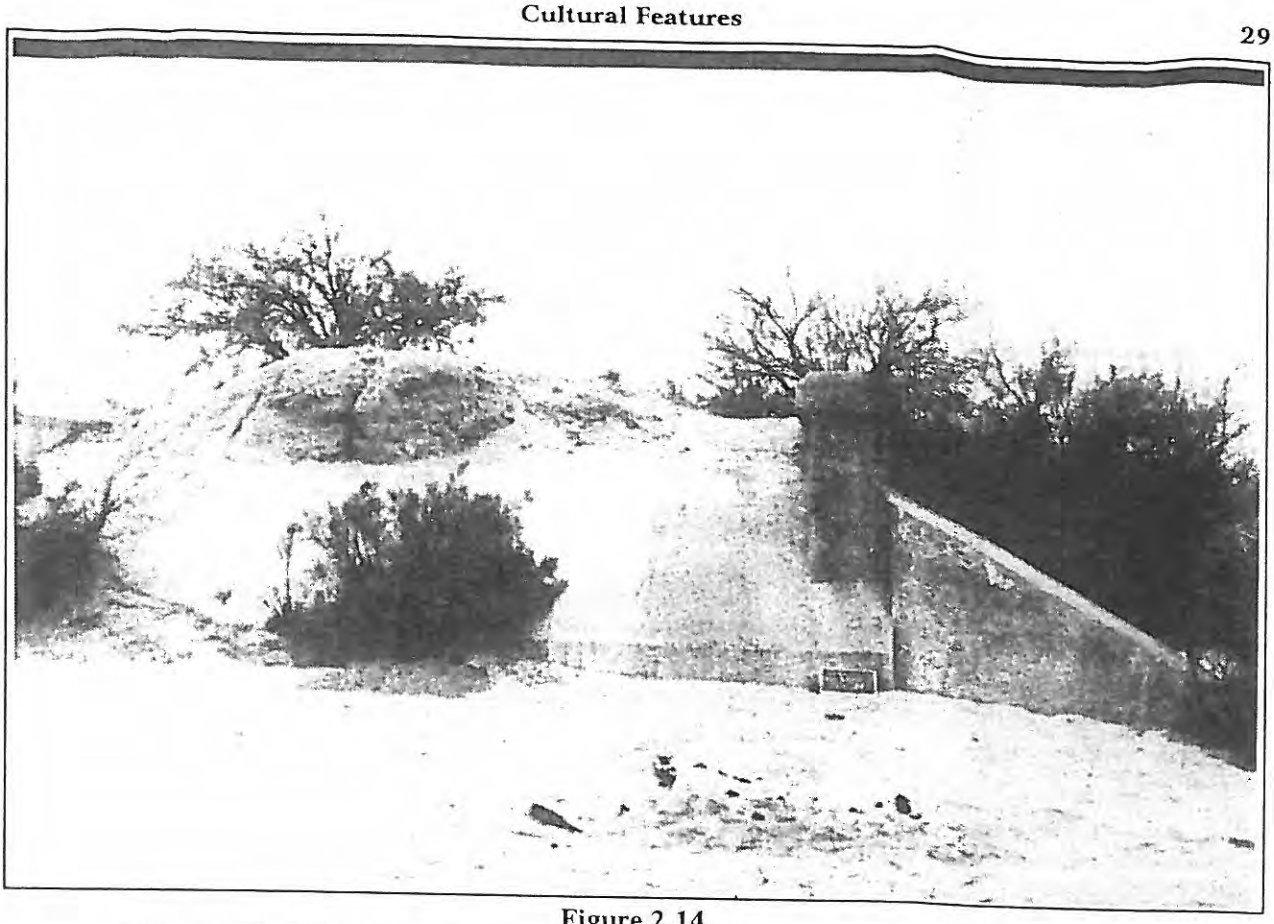


Figure 2.14
Photograph of washed-out arched culvert Feature 21 showing construction methods

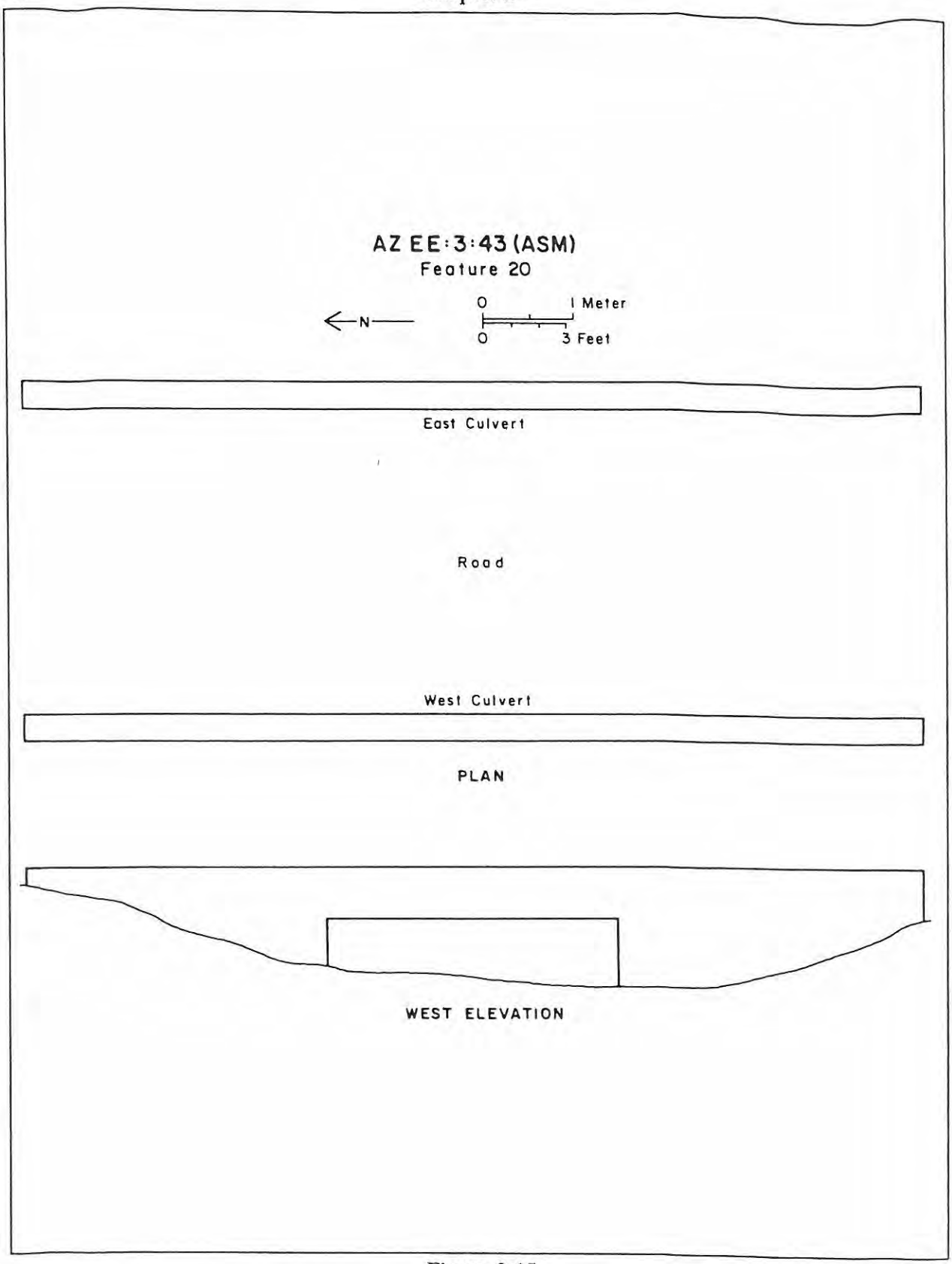


Figure 2.15
Plan and elevation drawing of box culvert Feature 20

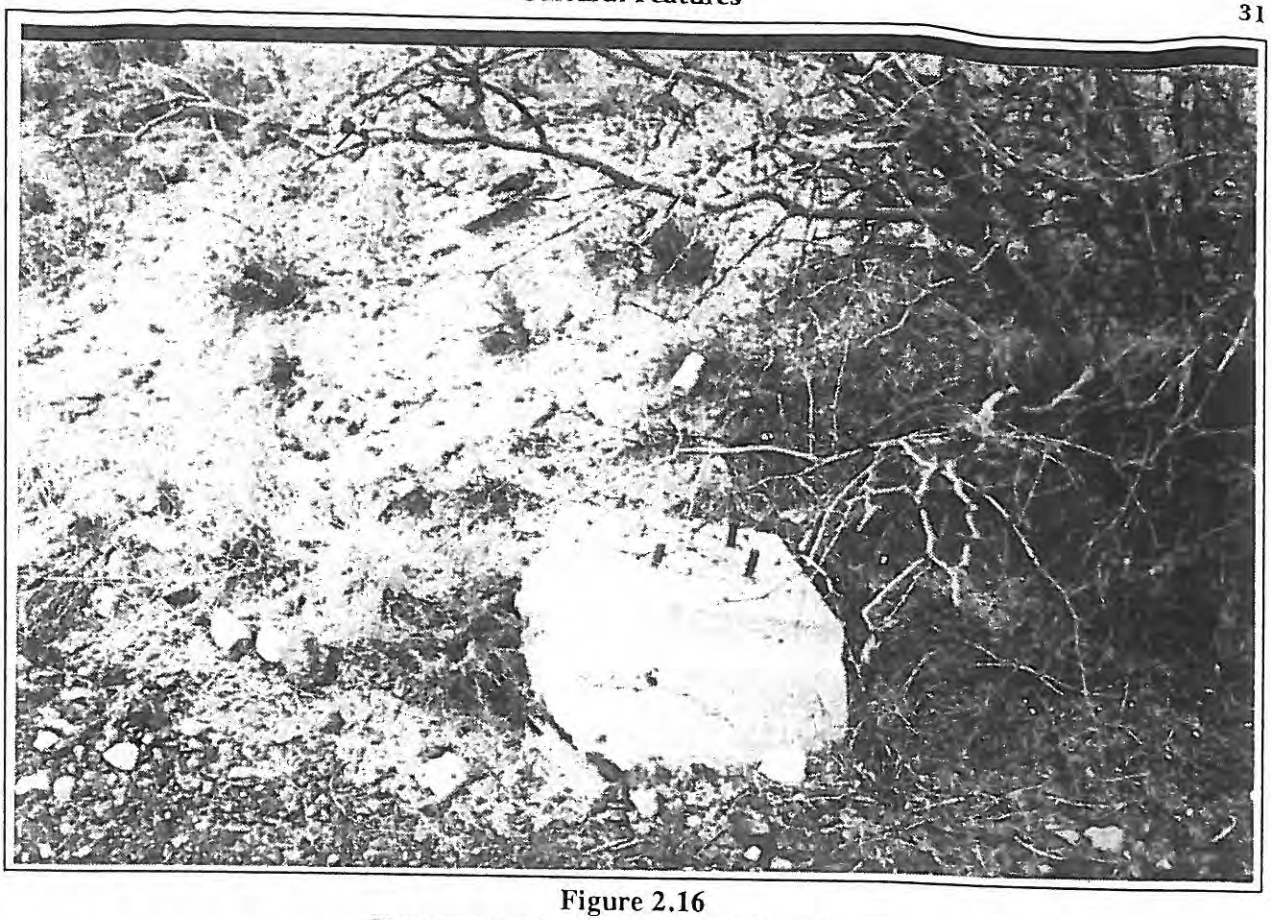


Figure 2.16
Photograph of concrete pedestal Feature 22

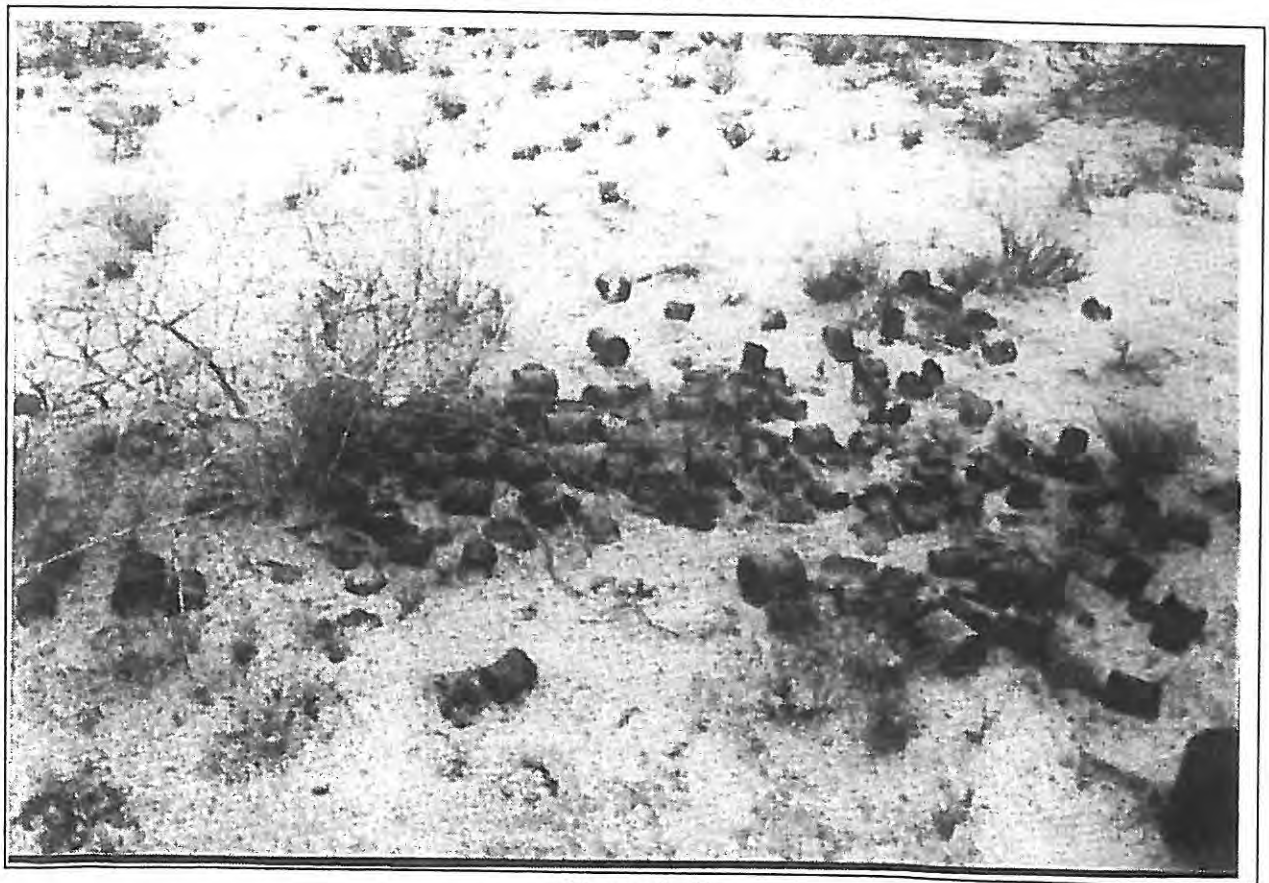


Figure 2.17
Photograph of historical can concentration at Feature 3

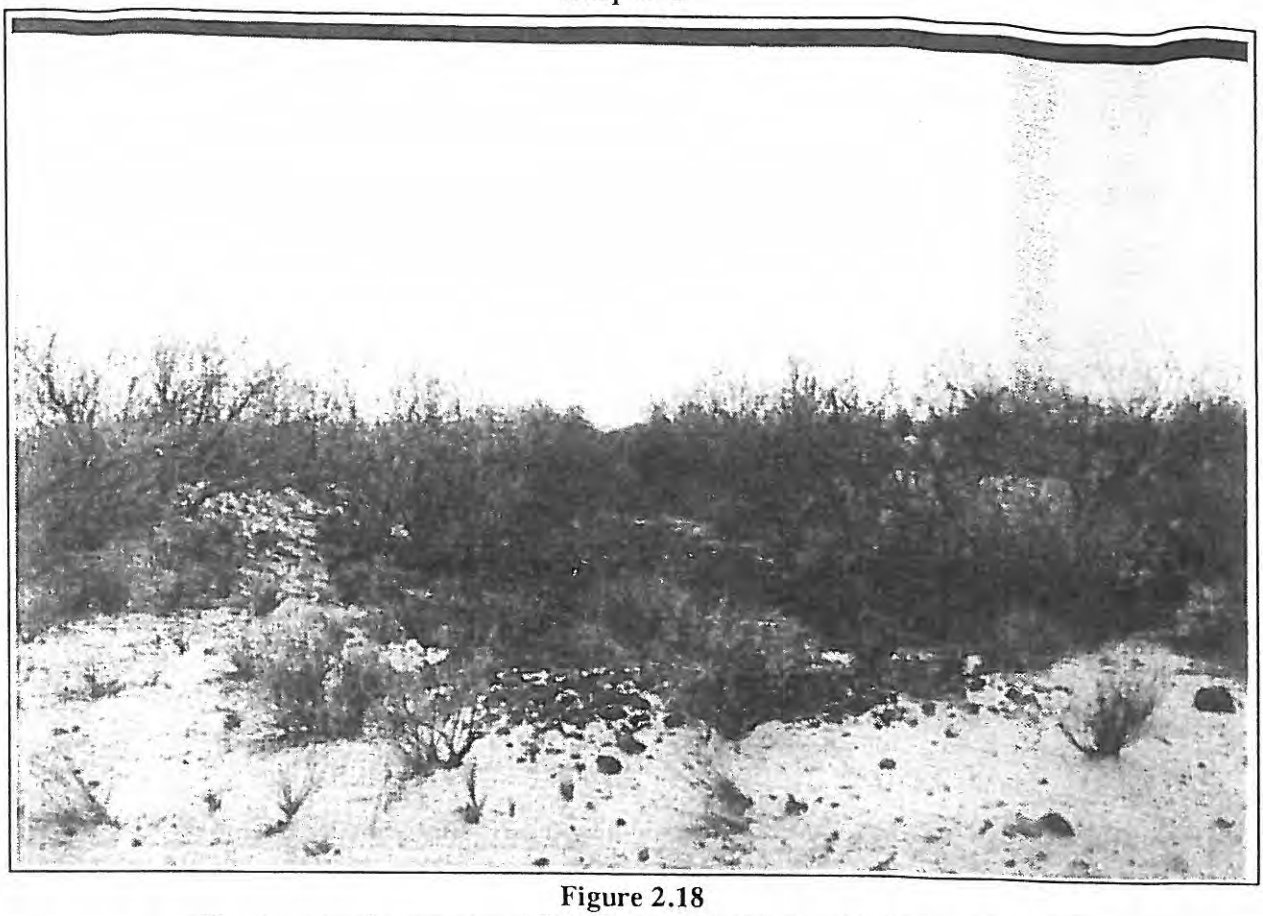


Figure 2.18
Photograph of temporary siding Feature 2 looking south from north end

Figure 2.19
Photograph of loading dock Feature 37

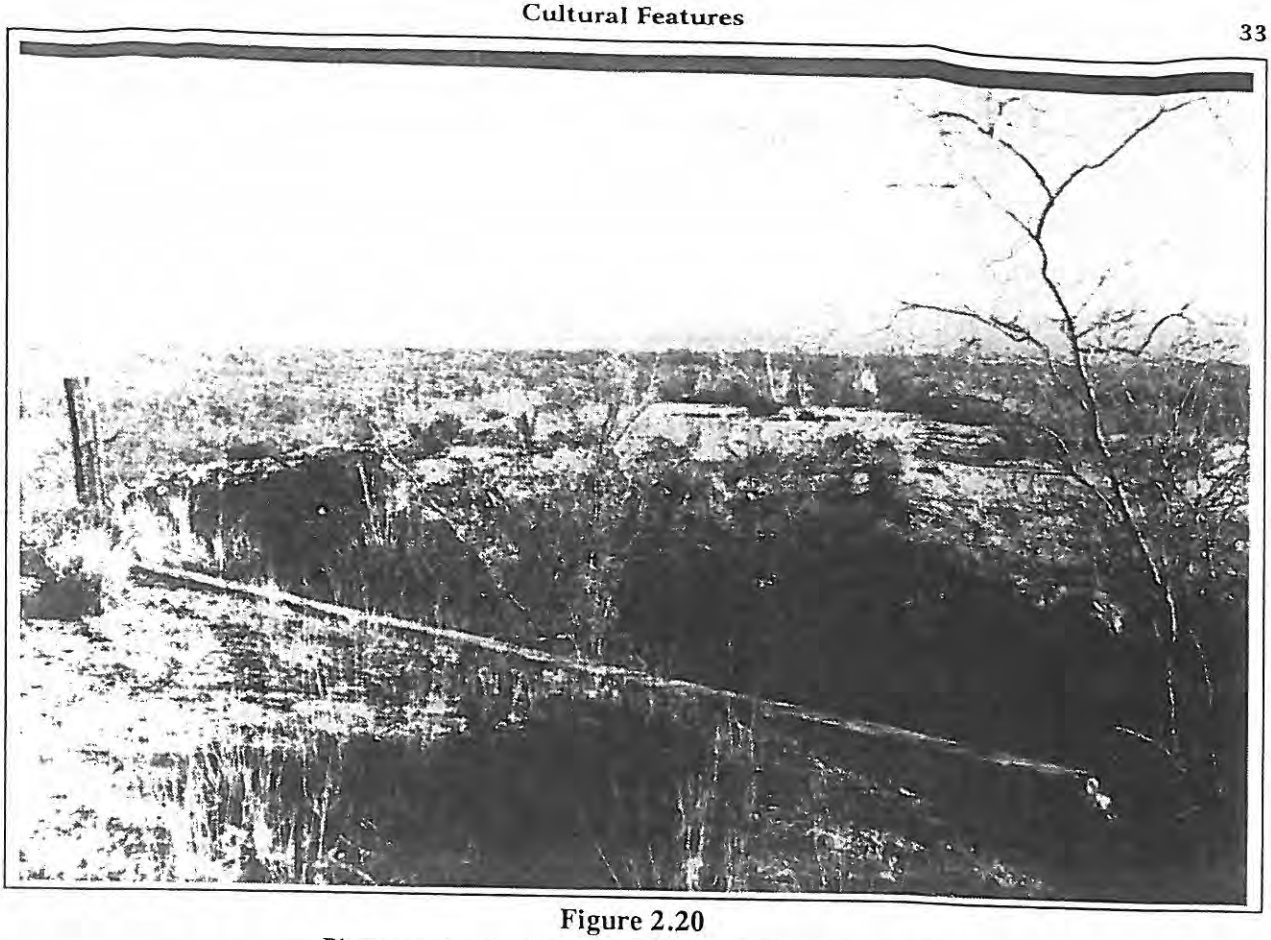


Figure 2.20
Photograph of cattle guard foundation at Feature 37

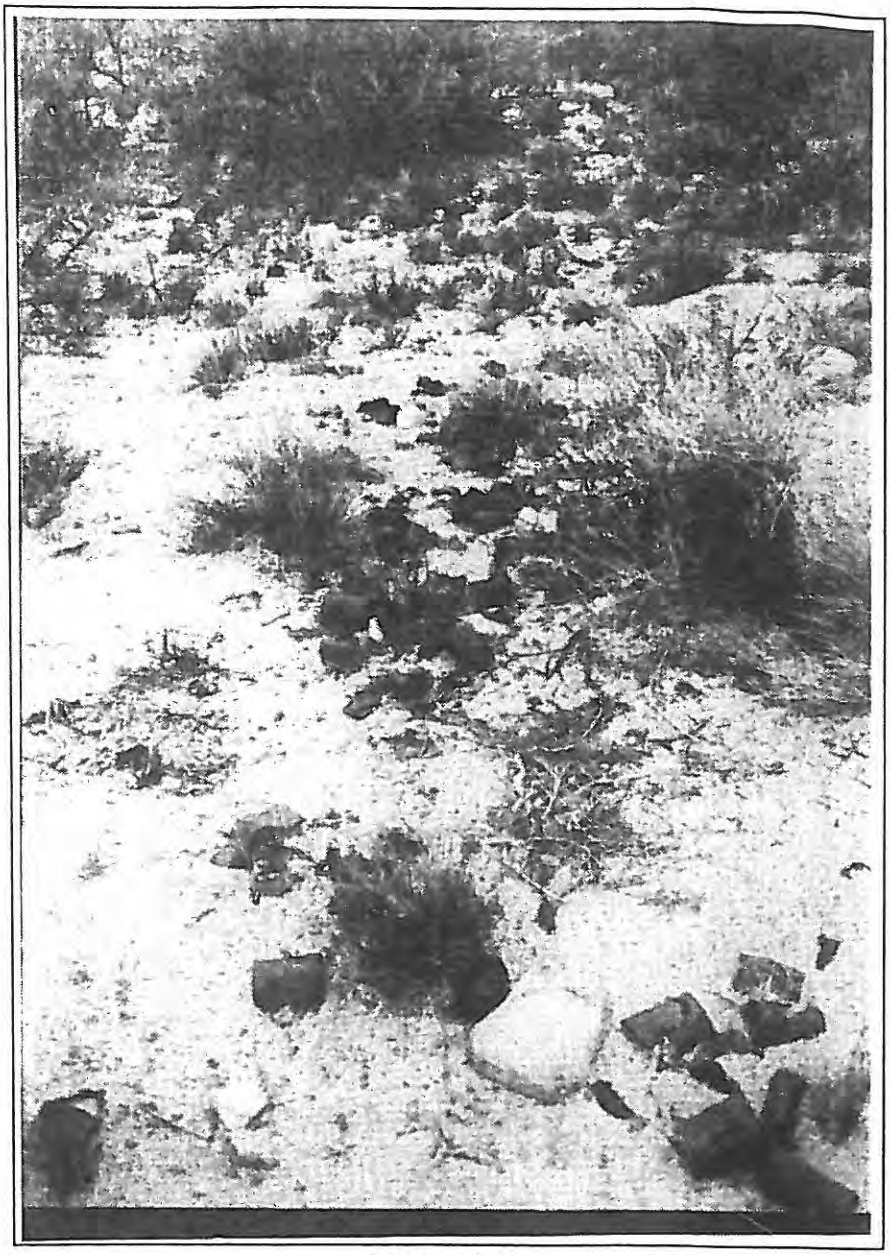


Figure 2.21
Photograph of solder-top can concentration Feature 27

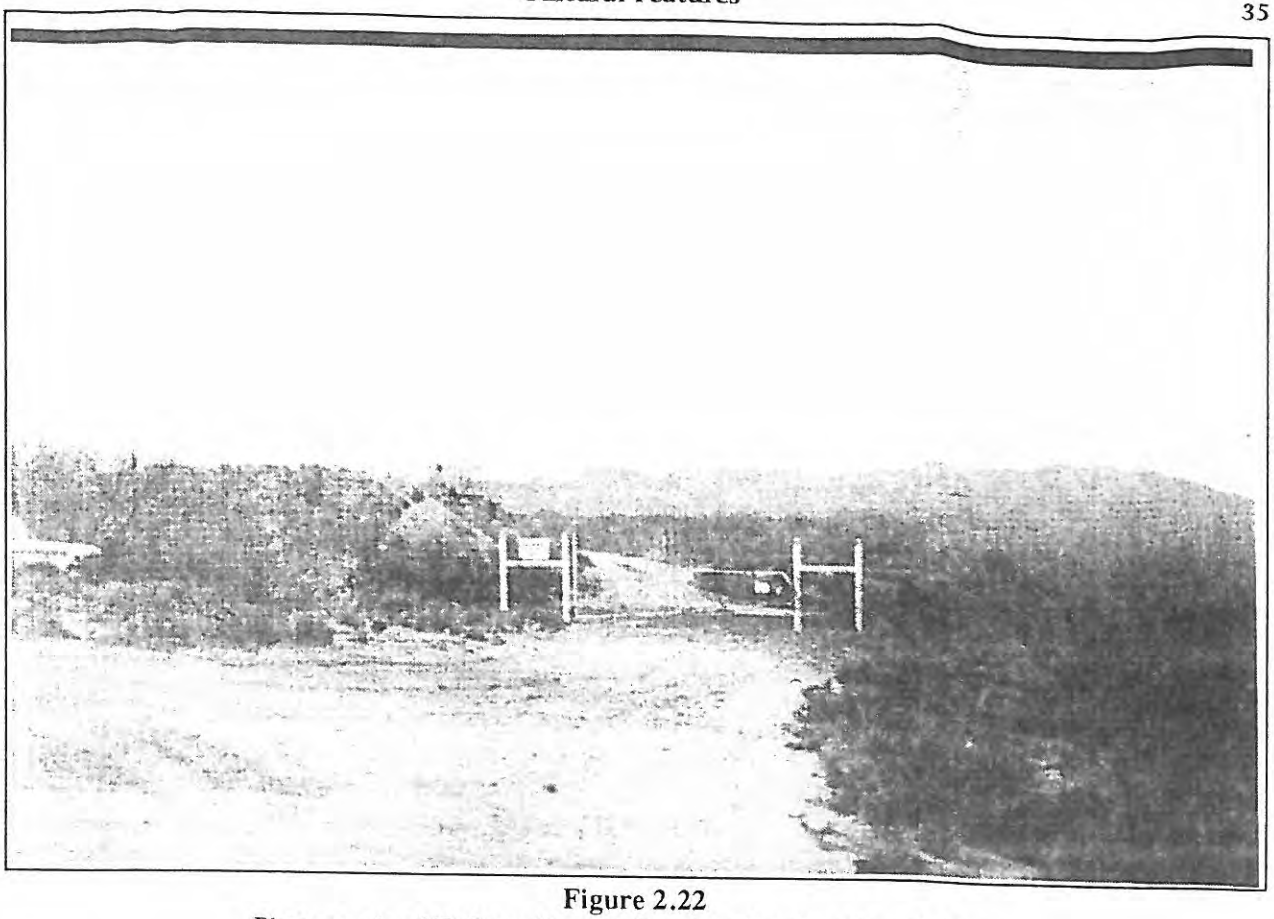


Figure 2.22
Photograph of El Paso Natural Gas Co. Pipeline No. 1007 gate

Table 2.1. Investigated El Paso and Southwestern Rail Road features on State Trust Land

Feature #	Feature type	Width (ins)*	Height (ins)*	Length (ft)*	Comments
28	Arched culvert	216	101	100	Winged abutments 24 inches thick, added concrete and cross-tie apron extends 35 ft northward, height is from top of sand
29	Signal flag foundation	72	52	NA	Same as Feature 5
30	Bridge	120	102	12	Six concrete pylons 10 ft apart supporting 24-inch poured concrete bed, 8'-6" etched into each pylon, straight buttresses, aprons consist of 18 inch high cemented natural stone wall supporting 8-ft-high poured concrete apron that extends 45 ft north and 20 ft south of bridge

* Culvert measurements are the inside dimensions. Lengths of culverts were estimated using topographic map.
NA = Not applicable

Table 2.2. Investigated El Paso and Southwestern Rail Road features on Whetstone Ranch private land

Feature #	Feature type	Width (ins)*	Height (ins)*	Length (ft)*	Comments
1	Arched culvert	48	48	30	Straight abutments 12 inches wide
2	Temporary siding	148	NA	NA	Temporary siding associated with El Paso Natural Gas Pipeline No. 1007
3	Camp site	NA	NA	NA	Probably associated with construction of Feature 2
4	Arched culvert	84	72	50	Winged abutments 12 inches wide, has been repaired with sloping concrete walls extending north and south from abutments an unknown distance (covered with sand) on upslope side, series of three 30 inch deep steps added to discharge side.
5	Signal flag foundation	72	52	NA	Foundation for flag signal, concrete box with 4 bolts for signal pole and passage to access signal controls. Has been bulldozed from original embedded location.
6	Signal flag foundation	72	52	NA	Same as Feature 5
7	Arched culvert	204	144	40	Winged abutments 18 inches wide, concrete base has been rebuilt
8	Arched culvert	204	144	40	Same as Feature 7
9	Signal flag foundation	72	52	NA	Same as Feature 5
10	Arched culvert	156	72	40	Winged abutments 18 inches wide, concrete base has been rebuilt
11	Arched culvert	312	144	80	Winged abutments 18 inches wide
12	Diversion dam	ca. 16	NA	NA	Asphalt dam, extremely eroded, diverts large wash north of Feature 11 into Feature 11 culvert.
13	Signal Flag Foundation	72	52	NA	Same as Feature 5
14	Signal Flag Foundation	72	52	NA	Same as Feature 5
15	Arched culvert	24	24	20	Straight abutments 12 inches thick, 12 ft long wings added on to abutments
16	Arched culvert	144	60	80	Arch-type, winged abutments 12 inches thick, culvert is placed to north of wash channel and wash was diverted into it with standing cross-tie dam
17	Arched culvert	48	24	40	Straight abutments 12 inches thick, height is from top of sand
18	Arched culvert	180	72	80	Winged abutments 12 inches thick, depth is to top of sand
19	Box culvert	144	24	12	Evidence of rebuilding, 35-ft-long railings along road bed, height is from top of sand
20	Box culvert	144	36	12	35-ft-long railings along road bed, height is from sand
21	Arched culvert	204	84	60	Winged abutments 18 inches thick, over half washed out
22	Concrete pillar	24	20	NA	Pyramidal pillar with 24 inch square base, 18 inch by 20 inch rectangular top, 4 ¾-inch diameter, National Coarse thread bolts, base for sign of some sort
23	Arched culvert	96	13	60	Winged abutments, height is from sand
24	Box culvert	120	24	12	30-ft-long railings along road bed, height is from sand
25	Box culvert	12	24	12	3 rectangular openings w/ 20-inch thick poured concrete walls separating them, 50-ft-long railings along roadbed, stencil says 4'10" on 1 wall, probably original depth, recorded height is from sand

Table 2.2. (Continued)

Feature #	Feature type	Width (ins)*	Height (ins)*	Length (ft)*	Comments
26	Arched culvert	24	24	20	Straight abutments 12 inches thick
27	Artifact scatter	NA	NA	NA	Contains estimated 50 hole-in-top cans in one concentration + 20 hole-in-top cans, 5 sun-colored amethyst glass shards, & 4 barrel hoops in surrounding area. Portions of scatter including main can concentration were outside the railroad right of way (not collected)
31	Arched culvert	24	18	20	Straight buttresses 12 inches wide, height is from top of sand
32	Box culvert	120	14	12	35-ft-long railing along roadbed, height is from top of sand
33	Arched culvert	96	51	100	Winged buttresses 12 inches wide, height is from top of sand
34	Arched culvert	48	36	100	Straight buttresses 12 inches wide
(Feature number 35 was not assigned)					
36	Arched culvert	156	92	40	Winged buttresses 18 inches wide, evidence of rebuilding, stenciled nos. "1035.64" are probably distance measurement along rail line
37	Loading dock	NA	NA	NA	Ramped, earthen loading dock along temporary siding Feature 2, badly eroded cross-tie and bridge timber shoring along edge facing siding, cattle guard at area where right of way fence crosses ramp

* Culvert measurements are the inside dimensions. Lengths of culverts were estimated using topographic map.
NA = Not applicable

Chapter 3

Artifacts from AZ EE:3:43 (ASM)

Jeffrey T. Jones

Descriptions of the methods used to collect a sample of artifacts, and of methods used to record those that were observed but not collected, are provided in Chapter 1.

This chapter describes artifacts collected or observed during the study of the El Paso and Southwestern Rail Road, AZ EE:3:43 (ASM), and presents the results of analysis. To begin analysis, collected artifacts were separated into basic categories of glass, Euro-American ceramics, and metal (Table 3.1). Artifacts that could be dated were assigned at least an approximate manufacture date based on their markings, shape, color, or other attributes. These dates have various degrees of reliability. For example, product names, maker's marks or logos, and glass color can provide a range of dates within which the artifact was made whereas coins and patent dates or numbers provide specific "no earlier than" dates. Sources for dating of specific artifacts can be found in Table 3.1 and are not reiterated in the following text.

ARTIFACTS COLLECTED AND ARTIFACTS THAT WERE ONLY FIELD-RECORDED

Twenty-three historical artifacts were collected from within the El Paso and Southwestern Rail Road right of way (Table 3.1). Seven are from possible camp Feature 27 in Section 33, T17S, R20E, near the northern end of the project area. One is from the vicinity of Feature 17 near the center of the project area in Section 3, T18S, R20E. The remaining ones are all from Section 15, T18S, R20E, including 8 artifacts collected from Feature 3 (a possible camping area just north of El Paso Natural Gas Pipeline No. 1007 and east of the railroad bed), 1 from Feature 37 (a ramped loading dock south of the gas pipeline and west of the railroad bed), and 6 from a non-cultural feature area where there was a very light but consistent scatter of artifacts over an estimated 200 meters south of Pipeline No. 1007 and east of the railroad bed.

Table 3.2 lists artifacts that were observed but not collected at Features 3, 27, and 37 during the fieldwork. A discussion of the artifacts associated with each cultural feature or collection area follows.

FEATURE 3, POSSIBLE CAMP SITE

Feature 3 was a graded-flat area between the railroad bed and the eastern right of way fence that contained a light scatter of artifacts. Artifacts collected from this area include portions of a white earthenware plate manufactured between 1931 and 1964 by the Wallace China Company, fragments of a 7-Up bottle with an applied vitreous label, and six machine-made steel food cans.

Machine-made food cans were first manufactured in 1904 but were not generally accepted by the food industry until after 1922 due to high fees of licensing agreements and the cost of new equipment (Fontana and Greenleaf 1962:73). Food can sizes were standardized in 1936. Two of the cans recovered from Feature 3 do not conform to post-1932 standard sizes so may have been manufactured before 1936. The other four conform to the 1936 standards so could have been manufactured any time between ca. 1922 and

2001. However, one of the conforming cans was a 3-lb coffee can with ribbed sides. This type coffee can was replaced by key-strip-opened vacuum packed cans after World War II (Broster and Harrill 1982:144).

Just east of the right of way fence is a concentration of metal cans that appears to be trash disposed of outside the right of way. Artifacts were inventoried but not collected from this feature (Table 3.2). Because the pile is over one can high, counts could only be estimated. Uncollected artifacts from the concentration include an estimated seventy-five cans that do not conform to post-1932 standards and thirty #3 cans.

FEATURE 27, POSSIBLE DUMP SITE

Feature 27 is a hole-in-top can concentration that contains several large, commercial-sized cans suggesting it was associated with a commercial kitchen to feed construction or maintenance workers. As the area is heavily dissected and offers little flat ground in which to set up a kitchen, the kitchen was probably operated from a rail car. Because the concentration was east of the railroad right of way and therefore outside the project area, artifacts within the concentration were inventoried but no artifacts were collected from it. However, a representative sample of artifacts was collected from within the railroad right of way in the immediate vicinity.

Collected artifacts include fragments of sun-colored amethyst (hereafter "SCA") glass, portions of a milk glass insert for a zinc canning jar lid manufactured between 1869 and ca. 1946, a Number 1 Tall condensed milk can made before 1932, a large solder-seamed can made between 1875 and ca. 1922, and a machine-made can that definitely post-dates 1904 and probably postdates 1922. Uncollected artifacts include seventy hole-in-top cans including 10 industrial size, five pieces of SCA glass, and four barrel hoops. The barrel hoops are probably from one barrel.

FEATURE 37, RAMPED LOADING DOCK

Feature 37 is a ramped loading dock that is adjacent the El Paso Natural Gas Pipeline No. 1007 and appears to be associated with the pipeline construction. One Richfield Circle-C, SAE 40, service MS D, motor oil can was collected from the surface within the railroad right of way at Feature 37, and an estimated 20 additional oil cans, a welding rod can, and a square 5-gallon oil or fuel can were scattered downslope from the ramp area. Most of these were outside the right of way as is most of the loading ramp.

The Richfield Oil Company was founded in California around 1901 to market oil products to the western United States. It merged with Sinclair Oil Company, an eastern United States oil company, in 1966 to form the ARCO, an acronym for the Atlantic Richfield Company (Henderson and Benjamin 1996:20-21). A date or year in which Richfield Circle-C motor oil was first offered for sale could not be located but it continued to be sold until the 1966 merger. The MS service rating means moderate to severe service and the D means the oil is for diesel engines.

VICINITY OF FEATURE 17

One artifact, a portion of a Coca-Cola bottle with a December 25, 1923 patent date, was found in the vicinity of culvert Feature 17. This bottle fragment was on the bluff overlooking the right of way and appeared to have been thrown from the train window. The so-called "Christmas" Coke bottles were intentionally dated to be collectible but were produced between 1923 and 1951.

NONFEATURE AREA SOUTH OF PIPELINE NO. 1007

A very light scatter of artifacts was located along the east side of the railroad bed south of El Paso

Natural Gas Pipeline No. 1007. The area is relatively flat but no evidence of grading or concentrations of trash that might suggest a camp area were identified. No steel cans or other metal objects were located there.

Artifacts collected from the area include sun-colored amethyst glass manufactured between 1880 and ca. 1917, portions of a Western Stoneware straight-sided crock manufactured between 1906 and present, a brown beer bottle base manufactured by the American Bottle Company between 1905 and 1929, fragments of a clear glass bottle base manufactured between 1920 and 1964 by the Hazel-Atlas bottle company, and portions of a brown glass machine-made bottle base with a keystone maker's mark but no other marking. The keystone maker's mark was used by several glass companies in Pennsylvania, the "keystone state," but cannot be assigned to any specific company without additional marking on the bottle base or sides (Toulouse 1971:558).

DISCUSSION

Artifacts associated with specific areas along the railroad provide some interesting data about activities taking place along the railway through time. Artifacts from possible camp site Feature 3 suggest the camp was used between 1931 and ca. 1936. The camp area is immediately east of temporary siding Feature 2 and loading ramp Feature 37 (which is thought to be associated with the construction of El Paso Natural Gas Pipeline No. 1007). Pipeline No. 1007 was constructed in 1933 (Mangan 1977), a date that falls nicely within the 1931 to ca. 1936 date range, suggesting Feature 3 was an area where natural gas pipeline construction crews camped.

Artifacts associated with the ca. 200 m long area east of the railroad bed and south of the gas line appear to be somewhat earlier than those from Feature 3. The date range suggested by the collected artifacts from this area is 1920 to ca. 1929. However, these artifacts are widely scattered and it cannot be assumed that they were deposited during any single event. Additionally, the earliest and latest manufacture dates of the various artifacts range from 1880 to 1964. Therefore, it seems likely that the artifacts collected from this area represent occasional use of the area by railroad construction and maintenance crews, and perhaps refuse thrown from trains, over the life of the railroad.

The presence of a light artifact scatter south of the pipeline and not along other portions of the roadbed on the Whetstone Ranch property probably reflects the relatively flatter terrain south of the pipeline. Other sections of the bed cross extremely dissected terrain and alternate between deep cuts through ridges and built-up areas across deeply incised washes, so if equal numbers of artifacts were deposited in these rougher areas they may have since washed away or become buried.

Artifacts associated with can concentration Feature 27 and the surrounding area include several large, commercial-sized hole-in-top cans suggesting this feature was associated with a commercial kitchen to feed construction or maintenance workers. Date ranges from these cans and other artifacts from the area fall between 1904 and ca. 1917, so the refuse may be associated with the 1912 construction of the railroad. As the area is heavily dissected with little flat ground in which to set up a kitchen, the kitchen was probably operated from a rail car.

Artifacts from areas outside of Features 3 and 27 and the 200-m-long segment of right of way south of the pipeline are extremely sparse. These consist of a few smashed bottles, most likely thrown from a moving train, three hole-in-top tapered meat cans, and numerous modern beverage cans and other trash probably associated with hunters, target shooters, and illegal immigrants that currently travel along the railroad bed. The smashed bottles generally were too fragmented to read makers' marks so could be either modern (dating between 1951 and 2001) or historical. The hole-in-top meat cans date between 1880 and ca. 1922. All were found fairly close to the road bed so probably represent trash thrown from the train by maintenance workers or passengers.

Table 3.1. Artifacts collected from the El Paso and Southwestern Rail Road bed and right of way

Fea. no.	Prov./ bag no.	Date range	Count	Description	Reference
Ceramic artifacts					
3	101/3	1931-1964	1	White earthenware plate, 9 in diameter, double green stripe around edge, "WALLACE LX CHINA" maker's mark, Wallace China Company	Lehner 1980:158
	102/2	1906-P	2	Fragments of one same stoneware crock, refit, "WESTERN STONEWARE CO." in maple leaf design maker's mark, Western Stoneware Company	Lehner 1980:166
Glass artifacts					
26	100/2	1880-ca. 1917	4	Fragments sun-colored amethyst glass, 2 body, 1 neck, 1 neck w/double bead applied finish & tapered opening for glass stopper.	Hull-Walski and Ayres 1989
		1869-ca.1946	3	Fragments of 1 zinc canning jar lid's milk glass insert	Ketchem 1975
3	101/1	Post 1931	3	Fragments of same 7-Up bottle w/applied vitreous label	Berge 1968:348
0*	102/1	1880-ca. 1917	4	Fragments of sun-colored amethyst glass, 3 fragments of same flask, base w/no maker's mark, blown into mold; 1 neck w/double bead finish.	Hull-Walski and Ayres 1989
		1905-1929	1	Brown glass bottle base, "A B Co" "6" maker's mark, American Bottle Co.	Toulouse 1971:30
		1903-P	2	Fragments machine made brown glass bottle base, keystone maker's mark, stippled base, "w-491" (dates of machine made bottles).	Lorrain 1968:44
		1920-1964	1	Fragment clear glass bottle base, Hazel-Atlas H over A maker's mark	Toulouse 1971:239
17	103/1	1923-1951	5	Fragments of Christmas 1923 commemorative Coca-Cola bottle	Watters 1978
Metal Artifacts					
26	100/1	Pre-1932	1	Number 1 Tall condensed milk can, punctured with knife to open	Fontana and Greenleaf 1962:75
		1904-P	1	Number 2½ standard machine-made can, knife-opened, dates of machine-made cans	Rock 1987:14
		1875-ca. 1922	1	Large solder-seamed can, knife-opened, ca. 6-inch diameter by 6¾-inch high	Fontana and Greenleaf 1962-70
		Unknown	1	Wooden-handled tool collar, similar to collar found on pike tool used to move round poles	
3	101/2	1904-P	1	Number 10 standard machine-made can, puncture-opened, probably contained juice	Rock 1987:14
		1904-ca 1945	1	3-lb coffee can, machine made, ribbed sides	Rock 1987:14; Broster and Harril 1982:144
		1904-P	1	Lard bucket, machine made	Rock 1987:14
		1904-1935	1	Machine-made can, 4 in diameter, 4 11/16 in tall, does not conform to 1936 standards, bayonet-type opener	Rock 1987:14; Fontana and Greenleaf 1962:73
		1904-1935	1	Machine-made can, 3 in diameter, 3½ in tall, does not conform to 1936 standards, bayonet opener	Rock 1987:14; Fontana and Greenleaf 1962:73
		1904-P	1	Machine-made can, 2 5/8 in diameter, 2 in tall, probably chili can, bayonet opener	Rock 1987:14
37	104/1	?-1966	1	Richfield Circle-C Motor Oil, SAE 40, Service MS D, motor oil for diesel engines	Henderson and Benjamin 1996:20-21

* Feature 0 = ca. 200-m long area south of Feature 3.

Table 3.2. Inventory of artifacts observed but not collected

Fea. no.	Artifact type	Count	Description
0	Glass	Estimated 50	SCA, brown, and clear glass fragments, all associated with collected bottle bases described in Table 3.1.
3	Machine-made can	Estimated 100	3½ in tall, 3 in dia., does not fit 1936 standards, bayonet-style opener.
		Estimated 50	No. 3 food cans, bayonet-style opener
		3	No. 10 food or juice can, punch-style opener
		8	3-lb coffee cans, bayonet-style opener
		1	Aluminum 16-oz beer can, removable pull-tab opener, along road bed and dates after ca. 1975
27	Hole-in-top can	Estimated 50	Round food cans, very rusty, may have been burned, approximate size 4⅜ in tall, 3 in dia., bayonet opener
		Estimated 15	Round food cans, very rusty, may have been burned, approximate size 4⅞ in tall, 4 in dia., bayonet opener
		9	Commercial food can, ca. 6-inch diameter by 6¾-inch high, knife opened
	Sun-colored amethyst glass	5	Fragments only
	Barrel hoops	4	Probably from 1 wooden barrel
37	Oil can	Estimated 20	All SAE 40 with service rating of MS D, 3 have legible logo: Richfield Circle-C
	Oil or Fuel can	1	Square 5-gallon can with pour spout and screw-on lid
	Machine-made can	1	Rectangular welding rod can, knife-opened

Chapter 4

Summary, Conclusions, Significance, and Recommendations

The history of the El Paso and Southwestern Rail Road (EP&SW) is summarized below followed by a discussion of what this investigation has contributed to our knowledge of the history of the railroad and the San Pedro River Valley. An evaluation of the railroad's archaeological significance and Old Pueblo's recommendations for future management is then presented.

THE EL PASO AND SOUTHWESTERN RAIL ROAD

The following summary is taken from Myrick (1975:177-249). The history of the El Paso and Southwestern Rail Road (EP&SW) begins in the summer of 1877 when members of the 10th U.S. Cavalry found silver "float" while looking for water in the Mule Mountains. Further investigation led to the discovery of extensive copper deposits and claims were filed on several copper mines in the Mule Gulch area. The copper mining town of Bisbee was founded in Mule Gulch in June 1880, and the Copper Queen Mining company was incorporated April 2, 1881, to manage the mines. On August 6, 1885, the Copper Queen Mining company merged with Phelps Dodge Corporation, then a small New York metal importing firm, to form the Copper Queen Consolidated Mining Company (Copper Queen).

Early in the Copper Queen's history bullion from the Bisbee smelters was hauled by freight wagon to the New Mexico and Arizona Rail Road (NM&A) at Fairbank, Arizona. The freight wagons returned to Bisbee with coke to fire the smelters. By 1888 the Copper Queen smelters were turning out 20,000 tons of copper annually and the company began surveying for a railroad line to replace the mule-drawn freight wagons. They incorporated the Arizona and South Eastern Rail Road Company (A&SE) on May 24, 1888, and completed a rail line linking the mines at Bisbee to the NM&A railroad at Fairbank on February 1, 1889.

After a dispute concerning the NM&A railroad's freight rates, the Copper Queen Consolidated Mining Company began hauling copper from their A&SE station at Fairbank to Benson via freight wagon and, between July and October 1894, extended the A&SE railroad to Benson, paralleling the NM&A railroad on the east side of the San Pedro River.

As copper production increased in Bisbee, smelter capacity needed to increase but the town had no more room for expansion. The Copper Queen researched various proposed smelter sites in the area surrounding Bisbee and eventually constructed a new smelter in a flat area with available water approximately 26 miles east of Bisbee. The new smelter was named after Dr. James Douglas, a major partner in the Copper Queen mine, and led to the founding of the Town of Douglas. The company's A&SE railroad was extended to the new smelter and to Naco, Arizona, (on the Mexican border) where it connected to a Mexican railroad to bring ore from the Cananea mining district.

Because Douglas was the eastern end of the A&SE railroad, copper from the Douglas smelter had to be shipped westward through Bisbee to Fairbank and then northward to Benson before it could be transported to the eastern manufacturing centers via the Southern Pacific transcontinental railroad. A more direct route eastward from the Douglas smelter to the Southern Pacific line between Lordsburg and Deming,

New Mexico, would save over 100 miles of transportation costs so the Copper Queen asked the Southern Pacific to build a connecting line to Separ, New Mexico, while the mining company extended the A&SE line from Douglas to there. Southern Pacific refused and the Copper Queen decided to build its own line between Douglas and Deming and incorporated a new railroad company, the Southwestern Railroad of Arizona (SRA), on October 19, 1900.

Construction on the SRA line started in late 1900 with crews beginning construction from Deming westward, and from Douglas eastward. For reasons that remain unclear, the name of the Arizona portion of the SRA railroad that was being constructed eastward from Douglas was changed to the El Paso and Southwestern Rail Road on June 25, 1901. The New Mexico portion being constructed from Deming was also renamed, becoming the Southwestern Railroad of New Mexico at this time. Construction of the railroad between Deming and Douglas was completed on February 13, 1902. The EP&SW bought the Southwestern Railroad of New Mexico June 17, 1902, and extended the line to El Paso, Texas, finishing in December 1902.

The EP&SW bought the El Paso and Northeast Rail Road in May 1905 and extended its service as far east as Tucumcari, New Mexico, where it linked up with the Rock Island Railroad. Also in the early 1900s the EP&SW constructed numerous short rail lines to mines in the Bisbee region and made plans to extend westward to either Tucson or Phoenix. Tucson residents lobbied for the railroad and collected donations from the public to help offset the cost of railroad construction so the decision was made to extend the EP&SW to Tucson rather than Phoenix.

Surveying for a route from Fairbank to Tucson began in February 1910. The A&SE line between Fairbank and Benson crossed the San Pedro River and continued along the east side of the river. To extend this line from Benson to Mescal (on the divide between the San Pedro and Santa Cruz river basins) would necessitate a 1.4 percent grade so project engineer R.H. Jones decided to route the Tucson extension along the eastern edge of the Whetstone Mountains pediment west of the San Pedro River where a more desirable 0.3 percent grade could be maintained.

Bids to construct the Tucson Extension were read on July 25, 1911, and a construction contract was awarded to McArthur Brothers, a well known railroad construction firm. Construction began on August 15, 1911 and was finished on October 31, 1912. During construction 2,547,951 cubic yards (1,947,975 cubic meters) of earth were moved.

The first scheduled EP&SW passenger train arrived in Tucson on November 20, 1912 with Fred Weimer as the engineer and J. W. Hayward the conductor. However, construction of the passenger station in Tucson was not completed until December 1913.

As an interesting side note, the EP&SW had money left over from construction of the Tucson extension and decided to return the money that Tucson citizens had donated for railroad construction. As no record was kept of donations, the money was used to build a new Y.M.C.A. downtown.

During and after World War I, between Dec 28, 1917 and March 1, 1920, all U.S. railroads were operated by the Federal Government. During the first part of this period the EP&SW boomed hauling copper for the war effort. However, after the war copper prices slumped and production was sharply curtailed, resulting in a 60 percent decrease in freight volume. Because the EP&SW only ran between Tucson and Tucumcari, New Mexico, and was dependent on copper revenues, it was faced with severe financial difficulties unless it could expand into other markets or merge with one of the transcontinental railroads. Negotiations were opened for a merger with Southern Pacific and on July 1, 1924, Southern Pacific gained control of EP&SW through an exchange of securities. The EP&SW officially became part of Southern Pacific on November 1, 1924.

The Great Depression of the late 1920s caused further problems in copper production and the Copper Queen mine shut down between 1931 and 1936. The 1930s were also bad years for the railroad business in southern Arizona. With low copper production already affecting the freight business, natural gas was brought into the smelters at Douglas and Bisbee in June 1931, causing the railroad to lose its fuel oil business also.

Copper production increased and business picked up after the depression. World War II and a good economy in the years after the war made the 1940s and 1950s good years for the railroads. However, traffic

east of Douglas on the original EP&SW line was slow and there were two lines from Bisbee to Tucson, the original NM&A line along the east side of the San Pedro River between Benson Junction (just north of Fairbank) and Benson, and the Tucson extension at the foot of the pediment along the west side of the river. Southern Pacific applied to abandon the original EP&SW line east of Douglas and the portion of the Tucson extension between Benson Junction and Mescal. The application was approved by the International Commerce Commission (ICC) on December 20, 1961, but a Federal restraining order was issued to halt removal of the tracks and associated equipment pending further hearings, although operations were allowed to cease. Litigation continued until May 21, 1963, when the U.S. District Court for Arizona affirmed the ICC decision and the rails were subsequently removed.

THE WHETSTONE RANCH PORTION OF THE EL PASO AND SOUTHWESTERN RAIL ROAD

The portion of the EP&SW located on the Whetstone Ranch property is a section of the abandoned portion of the Tucson Extension. The portion of the roadbed investigated during Old Pueblo's fieldwork included remnants of the bed, intact concrete culverts, and some areas of slag ballast, but no remaining cross ties or rails. Concrete culverts are still functioning but large areas of the bed have been washed out or buried in alluvium. Both sides of the railroad bed are fenced with barbed wire and split cross ties but the fence is mostly down. A few stumps are visible where a telegraph or electric power line ran along the western side of the railroad bed. Poles were cut off at ground level but one portion of a pole that still included portions of two cross arms but no insulators was found. The other poles were apparently removed from the area many years before Old Pueblo's 2001 study.

Pole stumps average 9 inches in diameter throughout the Whetstone Ranch portion of the right of way, and are spaced an average of 160 ft apart. All of the pole stumps on privately owned ground (i.e., outside of the State Trust land in Section 28) were cut with a saw within approximately 6 inches of ground level but two poles on State-owned land were chopped off with an axe, suggesting at least two different people were involved in their removal. Two larger poles averaging 15 inches in diameter were installed presumably to raise the power or telegraph lines higher above the Feature 37 loading ramp. The presence of two cross arms suggests the poles carried multiple lines of some sort. An inspection of photographs of the railroad line at various locations in Myrick (1975) also suggests that the poles carried multiple lines but it is impossible to distinguish between telegraph wires, electrical lines, and possibly telephone lines in these photographs.

Inspection of historical features within the investigated area demonstrated that two basic methods were utilized to construct culverts. These methods were not decided by the size of the culvert's passageway but rather by the anticipated flow volume. Culverts designed to channel water in deeply incised washes had an arched passage and were taller than they were wide. Culverts in wider, shallower washes were box culverts which are rectangular with wide, shallow passages.

A temporary siding and a large, earthen loading dock were constructed west of the railroad bed adjacent to the historical El Paso Natural Gas Pipeline No. 1007. The siding and dock appear to be related to construction of the gas pipeline in 1933 although no mention of them was found in either Mangan (1977), the main source for information on El Paso Natural Gas Pipeline No. 1007, or Myrick (1975), the main source for information about southern Arizona railroads.

Datable artifacts from a graded camp area immediately east of the siding and loading dock suggest the camp was used between 1931 and 1936, a period which fits the 1933 pipeline construction period nicely and the artifact types present suggest the camp was for pipeline workers rather than railroad maintenance crews. Artifacts from a second possible camp area farther north near the current Post Ranch Road date to the time the railroad was constructed in 1912 and probably represent trash from a commercial kitchen contained in a train car used to feed construction workers. The workers also probably slept in train cars.

Trash concentrations at both camp areas are immediately outside the railroad right of way suggesting that the railroad and pipeline construction crews had a policy of not dumping trash on railroad property.

The scarcity of historical objects and lack of trash deposits within the remaining areas of the inspected right of way may indicate trash was deposited in washes and has since been carried away by flood waters, or that the trash was hauled out of the construction area.

CONCLUSIONS

Old Pueblo's fieldwork has produced important information on the history of the El Paso and Southwestern Rail Road and El Paso Natural Gas pipeline No. 1007 in the Whetstone Ranch area. Inspection of concrete features demonstrated construction methods used. Analysis of collected and observed artifacts provided temporal and functional information about specific features and areas within the railroad right of way.

The results of this study confirm the known construction and use dates of the railroad and indicate a camp for construction of the El Paso Natural Gas Pipeline No. 1007 was located east of the tracks across from a temporary siding and loading ramp utilized during pipeline construction.

EVALUATION OF SIGNIFICANCE

EVALUATION CRITERIA

Archaeological and historical sites generally are not considered significant unless they are eligible for listing in the National Register of Historic Places. To be listed in the National Register a historic property normally must be at least 50 years of age and must be significant according to the following definition:

> The quality of *significance* in American history, architecture, archaeology, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and:
>
> A. that are associated with events that have made a significant contribution to the broad patterns of our history; or
>
> B. that are associated with the lives of persons significant in our past; or
>
> C. that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
>
> D. that have yielded, or may be likely to yield, information important in prehistory or history [National Park Service 1986].

SIGNIFICANCE ASSESSMENT

When Old Pueblo's study began the portion of the El Paso and Southwestern Rail Road, archaeological site AZ EE:3:43, on the Whetstone Ranch contained archaeological materials that were more than 50 years old, that were associated with events that have made a significant contribution to the broad patterns of Arizona history, that embodied distinctive characteristics of a method of construction, and that had potential to yield information important in history, so the site was significant under evaluation criteria "A," "C," and "D" cited above.

Some of the integrity of the EP&SW's Whetstone Ranch segment as a cultural resource had been

compromised by removal of cross ties and tracks, telephone poles, and some of the ballast, as well as by erosion that was quite severe in some areas (e.g. see Figure 2.14). Yet before the present study was implemented this segment of the EP&SW still conveyed the historical significance of the railway. Before this study was undertaken the Whetstone Ranch railway segment had potential to provide new information on the ages of the various cultural features that were associated with this segment of the railroad (including the temporal relationship of the railway with historical El Paso Natural Gas Pipeline No. 1007), the kinds of activities that took place along the railway through time (including gas pipeline construction and other corporate activities), relationships of those activities to features of the landscape, and even use of the railway corridor as a form of intermodal transportation (e.g., for foot travel by undocumented aliens who entered the U.S. from Mexico).

However, with the completion of this study the railroad bed, right of way fences, and other visible archaeological features have been mapped and photographed, representative examples of the individual feature types have been drawn to scale, and a representative sample of temporally or culturally diagnostic artifacts has been collected. (Incidentally, all of the artifacts collected were found on private land that did not include the area where a transmission line is being proposed for construction.) Analysis of artifacts and data recovered during this study has been used to document this historical cultural resource in accordance with the *State Historic Preservation Act Documentation Standards for Historic Properties, revised April 1987* and to address the research issues noted in the preceding paragraph, and the results of this study have been published in this report. This report includes a map showing the locations of the individual cultural features discussed in the text and both photographs and drafted illustrations of selected features identified in the study area.

It is concluded that the information contained in this report is sufficient to mitigate any effects that development might have upon the segment of the EP&SW Rail Road studied for this project, on State Trust as well as private land, including development of a transmission line (which may be a federal undertaking) in Section 29 (Figure 1.1).

RECOMMENDATIONS

Old Pueblo Archaeology Center recommends that archaeological clearance be granted for development to proceed in the 200-foot-wide El Paso and Southwestern Rail Road right of way, with the following provisions:

1. Because the proposed project has the potential to affect historic properties and may be subject to review by the Rural Utilities Services or other federal agencies, consultation with Native American tribes that claim cultural affinity in the area should be initiated by the project sponsor on behalf of the federal government. At a minimum, the following tribal representatives should be informed about the kind of historic property (a historical railway segment) that has been identified and discussed in this study and how it is likely to be affected by any proposed federal undertakings, and these tribes should be invited to comment on Old Pueblo's study of this resource and to help identify any other areas or properties of traditional cultural value that might exist within the area of potential effect:

    - Dr. Peter Steere, Manager, Tohono O'odham Cultural Affairs Program, PO Box 837, Sells AZ 85634

    - Mr. Austin Nuñez, Chair, San Xavier District, Tohono O'odham Nation, 2018 W. San Xavier Road, Tucson, AZ 85746

    - Mr. Cecil Antone, Lieutenant Governor, Gila River Indian Community, PO Box 97, Sacaton AZ 85247

- Mr. Jon Shumaker, Cultural Resources Manager, Ak-Chin Indian Community, 47685 N. Eco Museum Road, Maricopa AZ 85239

- Mr. Ron Chiago, Development Analyst, Salt River Pima-Maricopa Indian Community, 10005 E. Osborn Road, Scottsdale AZ 85256

- Mr. Clay Hamilton, Hopi Office of Cultural Preservation, PO Box 123, Kykotsmovi AZ 86039

- Ms. Jeanette Cassa, Elder's Council Chair, San Carlos Apache Tribe, PO Box "O", San Carlos AZ 85550

- Dr. John R. Welch, Historic Preservation Officer/Archaeologist, White Mountain Apache Tribe Heritage Program, PO Box 584, Fort Apache AZ 85926

2. Once development begins, if any buried archaeological materials are unearthed by vehicle traffic, erosion, or any other land-altering activity on State-owned land, all disturbing activity shall be stopped in the vicinity of the discovered materials and they shall be promptly reported to the director of the Arizona State Museum as required by Arizona State Law (A.R.S.§41-844).

3. Once development begins, if any human remains, graves, or grave-related objects are discovered during construction on privately owned land, Arizona state law (A.R.S.§41-865) requires that work in their vicinity be halted, that the finds be reported to the Arizona State Museum, and that the Museum provide guidelines for disposition of the grave-related materials before work resumes.

4. Once development begins, if construction activities reveal any significant archaeological features below the ground that have not been discussed in this report, work in their immediate vicinity should be stopped until a professional archaeologist can examine those features and assess their significance. This recommendation does not apply to buried portions of the culverts, bridge, signal flag foundation, diversion dam, earthen unloading ramp, sign or light pedestal, cattle guard, ramp, or telegraph or electric power poles that are mentioned in this report (Chapter 2). However, it does apply to the historical El Paso Natural Gas Pipeline No. 1007; if any part of the actual buried pipeline is likely to be exposed as a result of development-related activities (e.g., by excavations to install new utility lines underground), the exposure activities should be documented with notes and photographs that can be used for documenting this historic pipeline in the event that the Arizona portion of the pipeline is replaced by its current owner (El Paso Energy Corporation), in accordance with Arizona's State Historic Preservation Act Documentation Standards for Historic Properties.

References Cited

Berge, Dale
1968 *Historical Archaeology in the American Southwest.* Unpublished Ph.D. Dissertation, Department of Anthropology, University of Arizona, Tucson.

Broster, John B., and Bruce G. Harrill
1982 *A Cultural Resource Management Plan for Timber Sale and Forest Development Areas on the Pueblo of Acoma. Volume 1.* Forestry Archaeological Program, U.S. Bureau of Indian Affairs, Albuquerque.

Bolton, Herbert Eugene
1936 *Rim of Christendom: A Biography of Eusebio Francisco Kino, Pacific Coast Pioneer.* Macmillan Company, New York.

Brown, David E. (editor)
1982 Biotic Communities of the American Southwest-United States and Mexico. *Desert Plants* 4. University of Arizona for Boyce Thompson Southwestern Arboretum, Superior, Arizona.

Dart, Allen
2001 *Cultural Resources Survey of a 3.10-mile by 200-foot Utility Corridor through the Whetstone Ranch Development Property in Benson, Arizona.* Letter Report No. 2000.041. Old Pueblo Archaeology Center, Tucson. In press.

Fontana, Bernard L., and J. Cameron Greenleaf
1962 Johnny Ward's Ranch: A Study in Historic Archaeology. *The Kiva* 28(1-2):1-115.

Henderson, Wayne, and Scott Benjamin
1996 *Guide to Gasoline Logos.* PCM Publishing, La Grange, Ohio.

Hendricks, David M.
1985 *Arizona Soils.* Centennial Publication. College of Agriculture, University of Arizona, Tucson.

Hull-Walski, Deborah A., and James E. Ayres
1989 *The Historical Archaeology of Dam Construction Camps in Central Arizona: Vol. 3. Laboratory Methods and Data Computerization.* Dames & Moore, Phoenix.

Jones, Jeffrey T.
2000a *Cultural Resources Survey of 868.58 Acres East of State Route 90 and South of Interstate Highway 10 near Benson, Cochise County, Arizona.* Letter Report No. 2000.025. Old Pueblo Archaeology Center, Tucson.

2000b *Cultural Resources Survey of a 16,380-foot by 200-foot Utility Corridor East of State Route 90 and South of Interstate Highway 10 Near Benson in Cochise County, Arizona.* Letter Report No. 2000.041. Old Pueblo Archaeology Center, Tucson.

2000c *Cultural Resources Survey of a 4.53-Mile-Long Portion of the Abandoned El Paso and Southwestern Rail Road Bed Southwest of Benson in Cochise County, Arizona.* Letter Report No. 2000.045. Old Pueblo Archaeology Center, Tucson.

2000d *Cultural Resources Survey of 960 Acres for Whetstone Ranch North Forty Project East of State Route 90 and South of Interstate Highway 10 Near Benson in Cochise County, Arizona.* Letter Report No. 2000.040. Old Pueblo Archaeology Center, Tucson.

Ketchem, William C.
1975 *A Treasury of American Bottles.* A & W Visual Library, New York.

Lehner, Lois
1980 *Complete Book of American Kitchen and Dinner Wares*. Wallace-Homestead Book Co., Des Moines.

Lorrain, Dessamae
1968 An Archaeologist's Guide to Nineteenth Century American Glass. *Historical Archaeology* 2:35-44.

Mangan, Frank
1977 *The Pipeliners: The Story of El Paso Natural Gas*. Guynes Press, El Paso.

Myrick, David F.
1975 *Railroads of Arizona. Volume 1: The Southern Roads*. Howell-North Books, Berkeley.

National Park Service
1986 *Guidelines for Completing National Register of Historic Places Forms*. Bulletin No. 16. National Register of Historic Places. Department of the Interior, Washington, D.C.

Rock, James
1987 A Brief Commentary on Cans. MS on file, Klamath National Forest, Yureka, California.

Toulouse, Julian Harrison
1971 *Bottle Makers and Their Marks*. Thomas Nelson, New York.

Wallace, Henry D.
1997 Presence or Parlance? The Meaning of "Hohokam" and Concepts of Culture, A.D. 800-1050, in Southeastern Arizona. Paper presented at "The Archaeology of a Land Between: Regional Dynamics in the Prehistory of Southeastern Arizona" seminar. Amerind Foundation, Dragoon, Arizona.

Wallace, Henry D., and William H. Doelle
1997 From Ballcourts to Platform Mounds to Rancherías: A Comparison of Three Organizational Strategies on the Lower San Pedro River. Paper presented at the 62d Annual Meeting of the Society for American Archaeology, Nashville, Tennessee.

Watters, Pat
1978 *Coca-Cola: An Illustrated History*. Doubleday & Company, Inc., Garden City.

Whittlesey, Stephanie M., Richard S. Ciolek-Torrello, and Matthew A. Sterner
1994 *Southern Arizona The Last 12,000 Years: A Cultural-Historic Overview for the Western Army National Guard Aviation Training Site*. Technical Series No. 48. Statistical Research, Inc., Tucson.